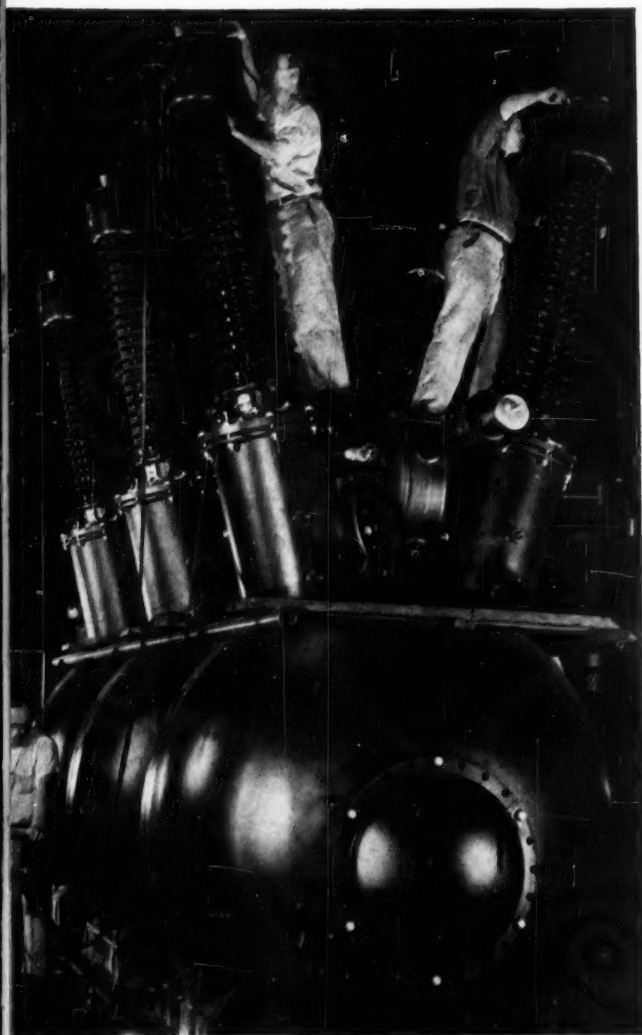


Chemical Week



Glassmakers' growth plans
broaden market horizon for
spate of chemicals . . . p. 21

◀ ***Power conversion alters
Niagara's future . p. 39***

New 'mental' drugs combat
depression, give lift to pro-
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Price cutting mars 'best year
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distributors p. 63

Collective bargaining nixed
by CPI's scientists, engineers
in new survey p. 66

July 4, 1959

STEVENS RICE
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How to fight fire beneath the sea

GO DOWN TO THE SEASHORE and you'll see metal doing a slow burn. Air and water combine to corrode it, and *salt* water adds fuel to these fires of *rust*.

But now there's an excellent way to fight oxidation of iron and steel—from ship hulls to offshore oil drilling rigs. The method: protect the metal above and below the waterline with a paint based on Shell Chemical's Epon® resin.

Because Epon resin chemically links to the metal surface, it forms an adhesive armor that wards off corrosion better than anything we know. Hard, yet

so flexible that a wallop will dent rather than shatter it, tough Epon resin coating also guards against corrosion in underground pipelines, washing machines, air conditioners, refrigerators, outdoor metal furniture . . . it's worth your knowing.

With Epon resins that shield man-made structures from wear and weather, Shell Chemical helps contribute permanence to a world of change.

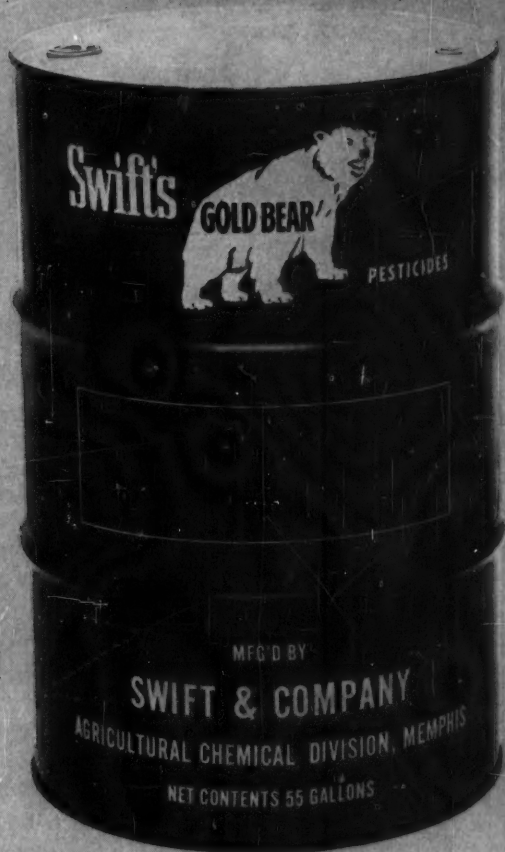
Shell Chemical Corporation

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NEW YORK



600 drums like this solved a problem...



When Swift and Company needed 600 decorated containers quickly for their new GOLD BEAR Pesticide plant in Memphis, they called on Southern States.

In 10 days, artwork was prepared and approved and 600 drums were delivered to Swift.

This is not a unique story. There's no waiting for drum delivery when you buy from Southern States. Drums to special specifications are turned out daily and on tight schedules.

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VINYL PLASTISOLS? YOU CAN MAKE THEM BETTER WITH GULF ISOOCTYL ALCOHOL

Children love the bright colors of vinyl toys . . . and so do manufacturers who cater to this growing market.

One good way to control the color of vinyls is to use di-ester plasticizers made with Gulf Isooctyl Alcohol. That's because Gulf Isooctyl Alcohol has low phthalation color . . . meets the highest standards of purity and uniformity . . . and is backed by Gulf's unmatched experience in oxo-chemistry. In short, Gulf Isooctyl Alcohol can be the beginning of a better end product for you.

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Better end products begin with Gulf Petrochemicals

Benzene • Ethylene • Isooctyl Alcohol • Propylene • Propylene Trimer and Tetramer • Sulfur • Toluene



TOP OF THE WEEK

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- ▶ **Butyl rubber demand climbs again,** as new outlets open. Bright hope for volume consumption: automotive tiresp. 31
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23 Now on order: 41% expansion for Phillips' big ethylene plant at Sweeny, Tex.

23 Watch western West Virginia: Montecatini moves ahead with polypropylene plant; Carbide adds more land to roomy future plant site; Carbide's Olefins Division sallies into lumbering business.

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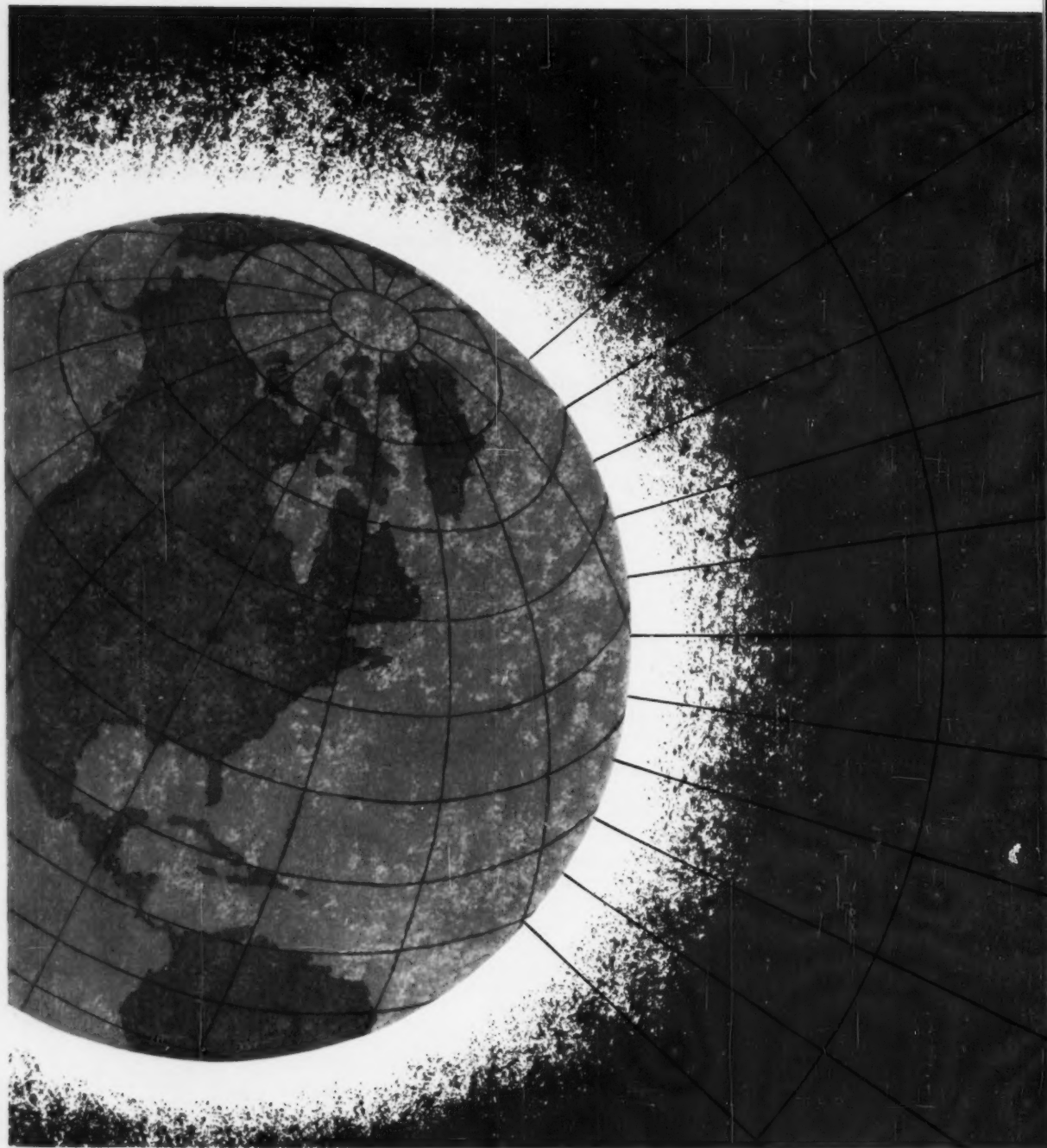
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How can you make these products...more efficiently

You have observed the rapidly growing demand for oxygen and nitrogen in the steel and chemical industries (and in many defense applications). Now a sharp upward trend in the demand for Argon and Helium is apparent. American Messer has designed highly successful plants for the largest producers of oxygen, nitrogen, and argon in the United States. Special purpose plants are being built by Messer for pure carbon monoxide, liquid methane, and pure hydrogen production.

"T H E R E I S N O S U B S T I T U T E

A diagram on a dark background with a grid of thin white lines. Six circles are arranged in a hexagonal pattern, connected by lines. Five of the circles contain chemical formulas: He at the top, A in the center, O_2 on the left, N_2 on the right, and H_2 at the bottom. The sixth circle, at the bottom right, contains the word "Messer" in a script font.

He

A

O_2

N_2

H_2

Messer

and more economically?

What are your requirements? If you are planning bulk Oxygen, Nitrogen, Argon, or Helium production (or the liquefaction of Hydrogen), it will pay you to talk with American Messer. We will gladly give you a frank appraisal of how you may solve best and most economically your particular problem. Write: Evan Johnson, President, American Messer Corporation, 405 Lexington Avenue (Chrysler Building), New York 17, N.Y.

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July 4, 1959 • Chemical Week

HYDROXYLAMINE
SALTS

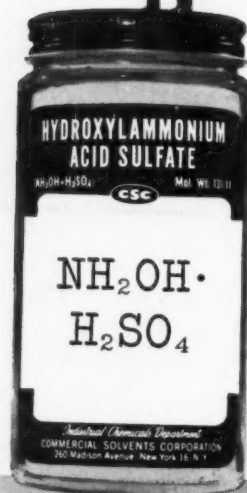
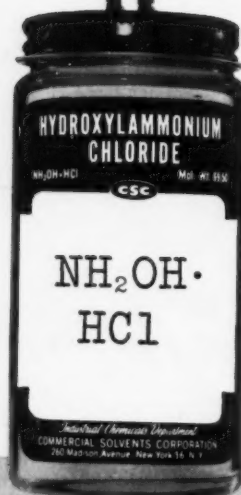
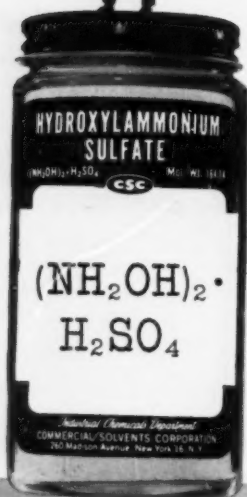
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☐ Sample of Hydroxylammonium Chloride

☐ Sample of Hydroxylammonium Sulfate
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THE BUSINESS MAGAZINE OF THE CHEMICAL PROCESS INDUSTRIES

VIEWPOINT

WHY WRITE ABOUT UNIONS?

Questions like this about a business publication's coverage of labor contracts and union organizing have often been asked. We've been asked—as have other publications serving the chemical process industries.

This week's CHEMICAL WEEK provides a good illustration of why business publications cover labor news. This is the week in which the steel industry wage contracts expire. It's a subject that every daily newspaper will cover thoroughly, leaving us little more to discuss than the subject of what a steel strike would do to coal-chemical supplies and delivery dates on process equipment.

Instead, let us direct your attention to one of the year's important stories on labor. When you get to page 66, you'll find a significant report on labor's "quiet revolution"—the changing pattern in the U.S. labor force and the resulting shift in labor unions' organizing objectives.

This is not the type of story you're likely to find in your daily paper, or see on television. Moreover, this report provides information for you in CPI management that has much more lasting importance than coverage of daily progress of the steel negotiations.

You read about strikes, corruption and violence in the papers; but it's the business press that reports the "quiet revolution." And business publications do more—a fact that was underscored, inadvertently, in an article in the Oil, Chemical & Atomic Workers' union newspaper about "white collar" organizing. It concludes with this sentence (emphasis supplied): "With management daily mending its fences to keep the employees out of unions, it is time for '[union] talk' to give way to action."

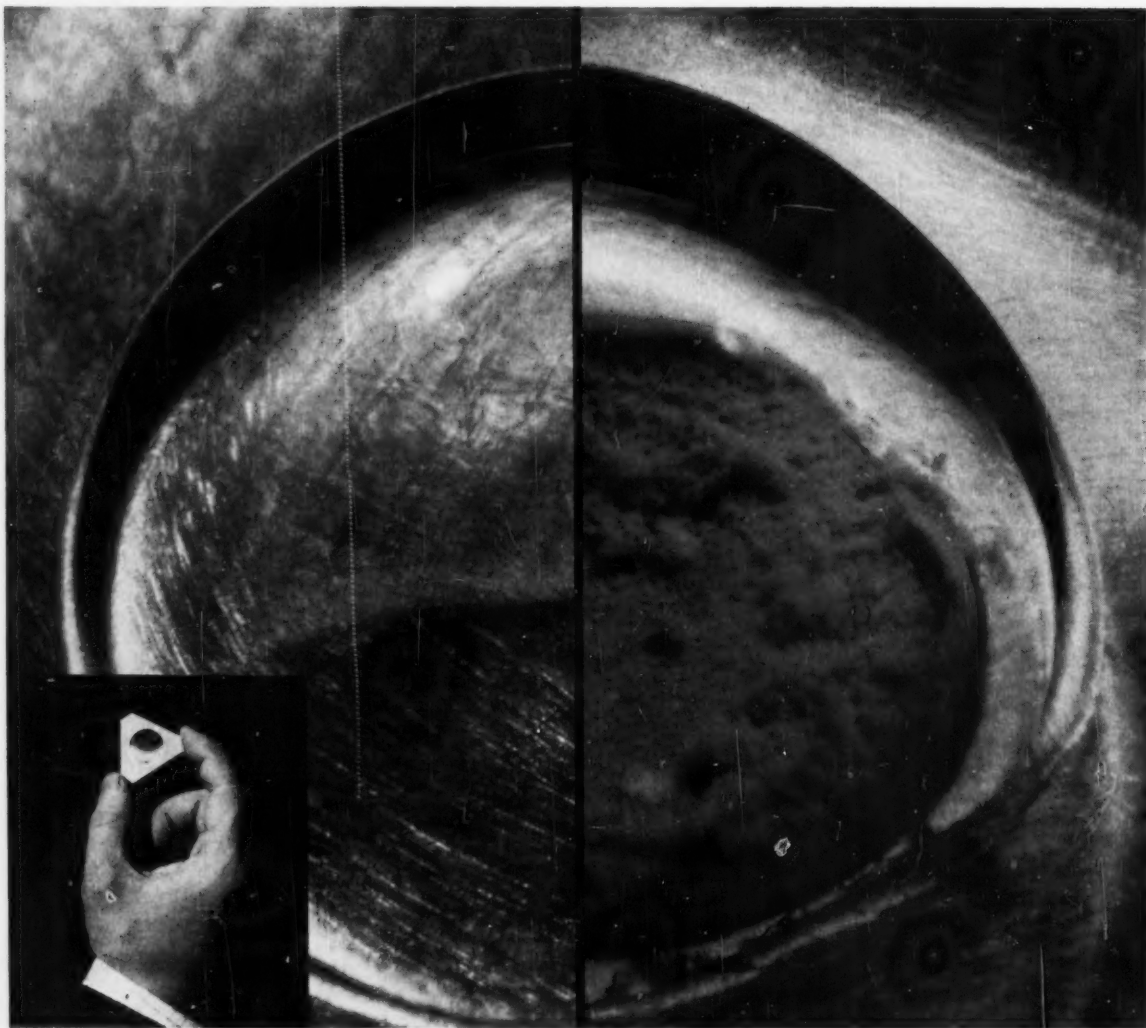
And who but the business press—as industry's intercommunication system—has been consistent in showing management the way to "mend its fences"?

H. C. Johnson

Editor-in-Chief

The surface Filming Properties of **Fatty Nitrogen*** Chemicals may improve your process, too!

In countless applications, Fatty Nitrogens inhibit corrosion, save time and dollars!



Small steel coupons, like this one, are used to test corrosive action. [*Static Water Drop Test—Ind. & Eng. Chem.*, 41, 137 (1949)]. A drop of water is placed on the coupon which is then submerged in mineral oil.

The steel coupon (left-half of photo) was treated with a General Mills Fatty Nitrogen Chemical. The one on the right was not. After identical periods of time, note that the treated coupon is clean and shiny, while the other is rough and highly corroded. The Fatty Nitrogen Chemical set up a protective barrier between the metal and the water, protecting the clean coupon from corrosive attack.

General Mills
Fatty Nitrogen Chemicals
already serve industrial America as:

Textile Conditioners—Chemical intermediates for home, commercial and industrial textile softeners. Small quantities of quaternary ammonium compounds (Aliquats) soften fabrics, minimize static, kill bacteria.

Corrosion Inhibitors and Bactericides—Primary and secondary amines (Alamines), N-fatty 1, 3-propylene diamines (Diams) and the quaternaries find widespread use as anti-corrosion compounds in crude oil production, transportation and storage. Certain of these compounds, particularly the quaternaries, have excellent bactericidal activity, too; find application in secondary oil recovery, circulating water systems.

Petroleum Product Additives—Added to petroleum fuels, furnace oils, aircraft and other fuels, primary and secondary amines and diamines not only disperse color bodies and banish sludge, but actually inhibit their formation. They also improve stability, inhibit corrosion.

Ore Flotation Reagents—Fatty nitrogen chemicals are used extensively for recovery of non-metallic ores such as phosphate, feldspar, mica, potash. Primary fatty amines and amine acetates (Alamacs) function by selective adsorption with concentration made either by flotation of ore values or of the gangue material.

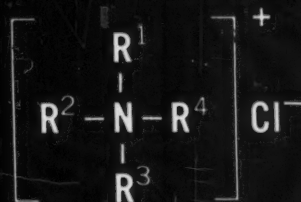
Asphalt Anti-strippers—Organic acid salts of diamines offer excellent bonding characteristics in patching and seal coating asphalt paving. They promote adhesion of paving compositions based on cutback asphalt, and prevent stripping of asphalt from the aggregate used in paving and patching compositions.

Hard Rubber Release Agent—General Mills primary amines are effective mold release agents for hard rubber articles, such as battery boxes. The amines help to produce a denser hard rubber product and reduce permeability.

WRITE FOR new Technical Bulletin 12-F "Fatty Nitrogen Chemicals in Petroleum Industries". For your copy address: Chemical Division, General Mills, Dept. CW71, Kankakee, Illinois.



Fatty Nitrogen Chemicals

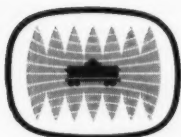


Above left, fatty primary amine; above right, fatty secondary amine; center, fatty diamine; lower left, fatty tertiary amine; lower right, fatty quaternary ammonium chloride.

These General Mills high quality Fatty Nitrogen chemicals are reactive organic compounds, derived from fatty acids of varying molecular weights and different degrees of saturation. The alkyl chain linearity of the parent fatty acids is carried over to the Fatty Nitrogen derivatives.

These key properties make Fatty Nitrogens extremely promising in many industries:

- ☒ **SURFACE FILMING**—Fatty nitrogen derivatives adsorb on metal as a monomolecular film and protect the metal from corrosive environment.
- ☒ **SELECTIVE ADSORPTION**—Fatty amines preferentially adsorb on certain non-metallic mineral surfaces; this surface modification enables the separation of ore components.
- ☒ **CHEMICAL REACTIVITY**—The fatty nitrogen derivatives are unique building blocks for organic chemical synthesis.
- ☒ **SOLUBILITY**—The fatty nitrogen derivatives have characteristic solubilities in a wide variety of polar and non-polar solvents.
- ☒ **SURFACE ACTIVITY**—The fatty nitrogen derivatives are cationic emulsifiers, wetting agents and detergents.
- ☒ **BIOCIDAL ACTIVITY**—The fatty nitrogen derivatives are effective against certain bacteria, fungi and algae.
- ☒ **BASE EXCHANGE**—The fatty nitrogen derivatives can replace inorganic ions in clays to make the clays compatible with organic liquids.
- ☒ **LUBRICITY**—Fatty nitrogen derivatives, electrochemically adsorbed on fibers and fabrics, lubricate the individual fibers and confer softness.



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FLUIDICS AT WORK

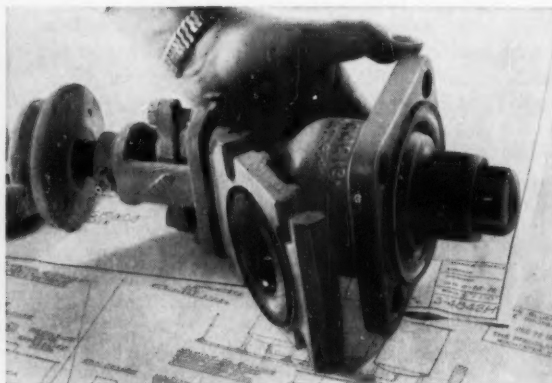
...developing new products and materials of construction for handling and processing fluids more profitably



Glasteel 59 with 30% more thermal shock resistance

This laboratory test shows iced water hitting 450°F. Glasteel 59. No thermal shock damage resulted. Our process equipment carries a safety factor of three, so Glasteel 59 now gives 150°F. thermal shock protection at a peak operating vessel temperature of 450°F.

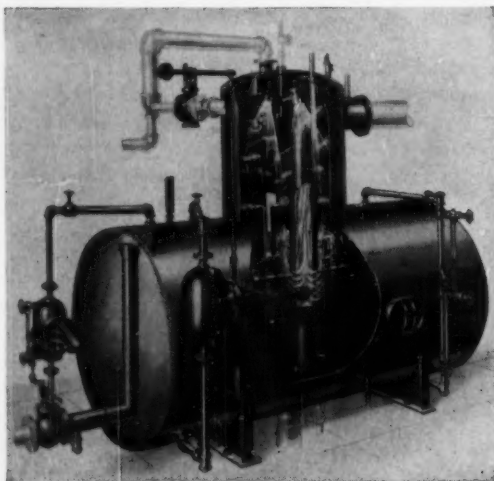
Glasteel 59 also offers excellent acid and alkali resistance. (Bulletin No. 980)



Glassed flush valve

The head and stem on this new valve are *one piece and glassed*... eliminating a major cause of valve failure. The rigidized Teflon-glass fiber seat permits firm seating without cracking the head covering.

This glass valve costs no more than conventional valves, with which it can be interchanged. Sizes from 1½ x 1 to 8 x 6 in six different models. (Data Sheet No. 42)

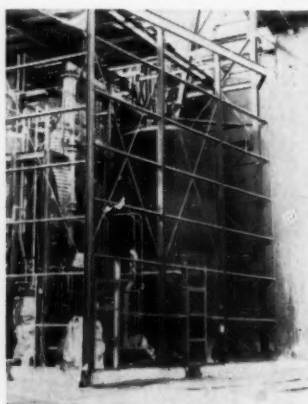


Deaerator that scrubs water to 0.005 ml/l of oxygen

You can process 150,000 lbs/hr of water through this Permutit Type B deaerator and reduce oxygen almost completely.

Type A deaerator handles up to 3,000,000 lbs/hr.

Both are available in either horizontal or vertical designs. (Bulletin No. 2357)



Glasteel chlorine dioxide generators resist all corrosives

Chemicals commonly used in the Solvay or Olin Mathieson processes have no corrosive effects at all on Glasteel generating equipment.

More than 35 pulp and paper mills find it the most economical equipment they can use when all costs are analyzed.



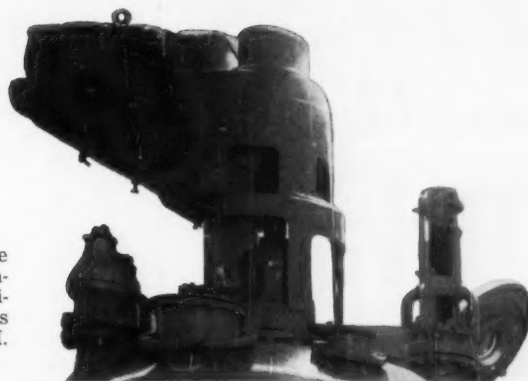
Tantalum bayonet heaters... 100% corrosion resistant

Tantalum bayonet heaters are completely corrosion resistant for practically all chemical processing applications.

You get heat transfer area up to 15 square feet, depending on tube size and number in cluster. Also available in large production sizes... heat exchangers, vessels, and reactors of tantalum—and of titanium and zirconium, too. (Bulletin No. 978)

Agitation drive cuts maintenance up to 50%

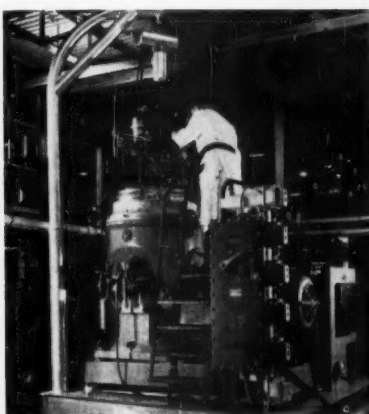
New Pfaudler BH Drive drastically reduces drive maintenance with these features: fast pilot fit alignment every time, longer-lasting shaft and seal, anti-friction bearings, Pfaudlerpac fast changeover seals or stuffing boxes, 12, 30, or 60 HP at 100 RPM. (Bulletin No. 972)



Electronic instrument for safe testing of glassed steel

The new PFAUDLERTRON glass tester—completely electronic—gives you a fast, visual signal when testing for exposed metal.

It has stabilized voltage, two probes (brush and needle point), cannot puncture sound glass or cause dielectric breakdown. (Bulletin No. 970)



Packaged centrifuge for in-plant production line testing

Now you can test our Titan centrifuge in your own production line *before you buy*.

All you need is an available 220/440 three-phase electrical service plus water to test our Titan centrifuge in your own production line with this portable unit.

It has 6000 gal/hr capacity and is complete with required pumps, valves, controls and other accessories.

This first of a series of packaged test units is available on a leasing agreement set to meet your particular needs.

We can also provide technical personnel for setting up and operating your test program. (Bulletin No. 946)



Glassed ductile-iron fittings* with strength comparable to Glasteel's

These glassed-ductile iron fittings have strength $2\frac{1}{2}$ to 3 times higher than that of low-strength gray iron.

Like Glasteel, they have high thermal shock and corrosion resistance.

Available now. (Bulletin No. 977)

*Pat. Pending

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• distillation • drying • blending • valving • piping • storing • centrifuging • filling • heat transfer

When you have a fluid-handling problem, try Pfaudler Permutit FLUIDICS program for the best solution.

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Write to Pfaudler Division, Dept. CW-79, Rochester 3, N. Y., for more information about the Fluidics program.

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the science of fluid processes

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As a bactericide and disinfectant, Blockson's TSP Chlorinated is tops. Ditto as a bleaching-sanitizing cleanser. Encore as a deodorizing agent. TSP Chlorinated is a double salt of Trisodium Phosphate and Sodium Hypochlorite. Available chlorine content over 3.25%. Sold under private label or as an adjunct for compounded cleansers. Write for sample, technical bulletin, prices. Stocked by all Blockson jobbers.



BLOCKSON CHEMICAL COMPANY

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Division of Olin Mathieson Chemical Corporation



OPINION

No Kodacolor Spray

TO THE EDITOR: It was of particular interest to read about work Socony Mobil Oil Co. has been doing in color photography in your article "Color Captures Research Realism" (May 9).

... We do not put a protective spray on Kodacolor prints or enlargements, with one possible exception. Upon special request, Kodacolor enlargements may be obtained with a matte rather than a semigloss surface. This matte surface is accomplished by means of a protective spray coating.

Although the matte finish gives a luxury look to Kodacolor enlargements in the larger sizes, we never supply it unless we are specifically requested to do so in the "special instruction" portion of the Color Finishing Envelope. It does not perceptibly darken colors, although I realize that for many industrial subjects, the semigloss surface might be preferred.

J. B. CUMMINGS

Technical Assistant to the
Service Manager

Color Print Service, Kodak Park
Eastman Kodak Co.
Rochester, N. Y.

New Anthracite Uses

TO THE EDITOR: Reference is made to ... your May 23 issue on a proposed coal chemicals project near Pottsville, Pa. The article on this subject in your May 30 issue has also been called to my attention.

Because of the Bureau of Mines' interest in alleviating conditions created by the decline in anthracite production, we have been conducting for a number of years a highly expanded research program to find new uses for anthracite and to increase output per man per day by new and improved mining methods.

An important part of this program has been to gasify anthracite to produce a synthesis gas from which a wide range of chemicals, including hydrogen, ammonia, nitrogen, methane, etc., may be made.

With this object in mind, the bureau several years ago conceived the idea of conducting large-scale tests in a commercial Lurgi gasifier. Arrange-

ments were made to have these tests conducted at Steinkohlengas AG. (Dorsten, Germany). The Bureau of Mines shipped 2,200 tons of anthracite overseas for the tests. The anthracite performed satisfactorily in the Lurgi generator and the results were published in Report of Investigations 5420. . . .

In addition, the bureau engaged M. W. Kellogg Co. to make an engineering study, based on the data obtained from the Dorsten tests, on the cost of producing pipeline gas and hydrogen in the U.S. This study is an open-file report. . . .

Although we have no detailed knowledge of the Dynamics Reading project, it is gratifying to know that the results of our tests are evidently of value . . . to concerns interested in the possible establishment of a chemicals industry in the anthracite region of Pennsylvania.

MARKING J. ANKENY

Director, Bureau of Mines
U.S. Dept. of the Interior
Washington, D. C.

MEETINGS

Gordon Research Conferences: At Colby Junior College, New London, N.H.—polymers, July 6-10; textiles, July 13-17; corrosion, July 20-24; organic coatings, July 27-31; medicinal chemistry, Aug. 3-7. At New Hampton School, New Hampton, N.H.—magnetic resonance, July 6-10; organic reactions and processes, July 13-17; microbiological deterioration, July 20-24; radiation chemistry, July 27-31; steroids and related natural products, Aug. 3-7. At Kimball Union Academy, Meriden, N.H.—solid-state studies in ceramics, July 6-10; chemistry, physiology and structure of bones and teeth, July 13-17; cell structure and metabolism, July 20-24; chemistry at interfaces, July 27-31; biochemistry and agriculture, Aug. 3-7.

American Soybean Assn., 39th annual convention, Sheraton-Jefferson Hotel, St. Louis, Mo., Aug. 11-12.

Technical Assn. of the Pulp and Paper Industry, 10th testing conference, Multnomah Hotel, Portland, Ore., Aug. 18-21.

Chemical Institute of Canada, Physical Chemistry Subject Division; symposium; theme: "Mass Spectrometry in Chemistry"; McMaster University, Hamilton, Ont., Aug. 30-Sept. 1.

1959 Cryogenic Engineering Conference; subjects: cryogenic processes, applications, equipment properties; University of California, Berkeley, Calif., Sept. 2-4.

*Emersol® Oleic Acid
ends odor problem
caused by rancidity*



Thousands of noses twitched—and each one signaled the loss of a repeat sale for a major stencil producer.

The problem, several years ago, was simply oleic acid rancidity. The firm tried another oleic acid. And another.

Finally, Emersol 233 LL Elaine. End of problem.

So they switched to buying Emersol 233 exclusively. And, their subsequent checks on a host of competitive oleic acids have borne out their earlier judgment—Emersol 233, with a polyunsaturate content of less than 5%, has far greater resistance to rancidity than any other oleic on the market.

The other superior qualities of Emersol 233 were incidental to this company. But if your particular oleic acid problems involve color, color stability, or purity, you too are very likely to find the answer in the across-the-board top quality specifications of Emersol 233 LL Elaine. And it costs not a penny more than competitive grades. Write Dept. I-7 for an evaluation sample or a 20-page comprehensive booklet on oleic acids.



Fatty Acid Sales Department
Emery Industries, Inc., Carew Tower, Cincinnati 2, Ohio
Vopcolene Div., Los Angeles—Emery Industries (Canada), London, Ontario
Export Department, Cincinnati

One in a series by "the men that make the most of them"

Polyol Portraits



the PROPYLENE POLYOLS

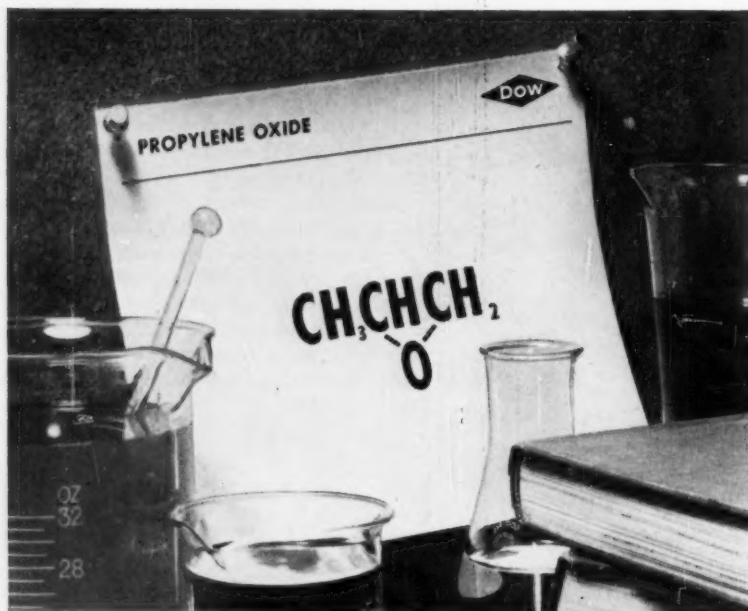
From propylene stems a major group in "the world's widest line of polyols" . . . the propylene glycols and the polypropylene glycols. The Dow offering in this important area is characterized by an exceptionally large group of high

quality propylene derivatives. As with any chemical product, the contents of the drum or tank car can be no better—and no worse—than the quality of the original raw materials that make it up, so let's start at the beginning.

Propylene oxide is, of course, the starting point. And Dow is *basic* in the manufacture of propylene oxide. Dow uses the chlorohydrin process, a method that yields PO of unsurpassed quality, purity and uniformity. Add to this the important fact that Dow has excellent control over all the ingredients that go into propylene oxide. In addition, Dow maintains its own cracking plant for propylene and has extensive facilities for the production of chlorine and caustic. Thus, Dow sets its own high standards of quality for PO and derivatives, and has itself to deal with in measuring up to them.

Dow plants at Plaquemine, Louisiana; Midland, Michigan, and Freeport, Texas, provide abundant supplies of PO and its derivatives. These plants, along with Dow's distribution network and fleet of specially equipped tank cars serve Dow customers throughout the nation. They help to maintain the firm PO price base that has remained stable for the past sixteen years.

The propylene glycols come in for their share of the quality spotlight, too. Because of the outstanding quality of its PO, Dow is one of the few companies producing a propylene glycol that qualifies for U.S.P. grade, Propylene Glycol, U.S.P., as well as Propylene Glycol, Industrial, Dipropylene



The uniform high quality of Dow's propylene oxide insures exacting purity in all propylene polyols.

Glycol and Tripropylene Glycol can be tailored to meet special customer specifications. For example, Dow Technical Service works closely with polyester resin manufacturers using custom tailored Propylene Glycol and Dipropylene Glycol to improve their products. This is one phase of a comprehensive technical service program on polyols, backed by Dow laboratory facilities and experienced field specialists.

Five bulk terminals proffer excellent service on many Dow glycols. They're strategically located at Bayonne, New Jersey; Chicago, Illinois; Freeport, Texas; Oakland and Torrance, California. One of the benefits customers derive from Dow's many years of experience with glycols is the protection given to shipments. Drums lined with epoxy resins are used to prevent iron pick-up and guard against contamination. Aluminum tank cars are also employed to protect the purity of glycol bulk shipments.

Polypropylene glycols present another interesting aspect of the polyol family. This sizable selection of light colored liquids finds its way into a multitude of products, ranging from paints to automotive products and back to urethanes. They offer excellent lubricity and solvency, as well as many other properties in highly useful combinations.

However, it is not so much their versatility that distinguishes Dow PPG's, as these two salient facts: (1) Again, because of the superior quality of the PO and other basic raw materials, these polyols offer uniform purity and

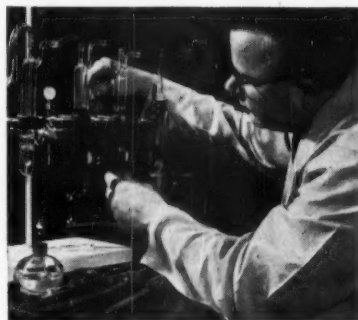
rigid adherence to specification. (2) In the hands of "the men that make the most of them", Dow's crack polyol team, the right PPG can be readily selected for every job. An important note is the fact that in many cases, Dow tailors polypropylene glycols to meet special requirements.

All these plus factors you get with PO and its derivatives when you buy from Dow are the result of one underlying fact of chemical life . . .

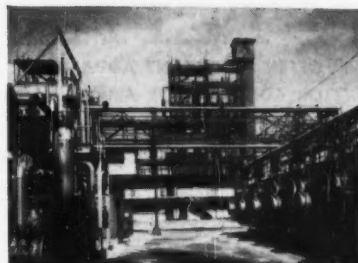
Dow is Basic in Polyols—

Whether you're in the market for glycols, PPG'S, PEG'S, glycerine or any of the hundreds of other Dow polyols, you always receive these benefits:

1. You always get the highest quality and uniformity in Dow polyols because Dow makes and controls the quality and uniformity of all the *ingredients* for all their polyols.
2. You are assured of plentiful, con-



Crack technical service team answers customer problems from coast to coast.



Dow polyol plants strategically located at Midland, Mich., Freeport, Texas and Plaquemine, La.

tinuous supply. As Dow itself is the original source for all raw materials, it better controls factors of availability.

3. You can look forward to stable, predictable prices because ingredient costs—again, controlled by Dow—are not subject to severe market fluctuations.
4. From the creative cauldrons of polyol chemistry at Dow come scores of new polyol products and polyol improvements each year. There are literally *no material limits* to the range of new developments that can be custom-made for Dow customers!

★ ★ ★ ★

It's easy as falling off a drum full of polyols to get in touch with "the men that make the most of them". This team of scientists, engineers, production and marketing specialists—all highly experienced in polyols—is at your service. Call the Dow sales office in your area, or write **THE DOW CHEMICAL COMPANY**, Midland, Michigan, Chemicals Merchandising Department 1102AM7-4.

THE POLYOL FAMILY TREE

Main branches include:

Glycerine • Glycerine USP
Glycerine USP 99.5%
Propylene Glycol, Industrial
Propylene Glycol USP
Dipropylene Glycol
Tripropylene Glycol • Ethylene Glycol
Diethylene Glycol
Triethylene Glycol
Tetraethylene Glycol
Polyethylene Glycols
Polypropylene Glycols
Polystyrene Glycols
Polyepichlorohydrin • Hyprose® SP80
Hyprin® GP25 • Polybutylene Glycols
Styrene Glycol • Dowanol® 122
Polyglycol 11 Series
Polyglycol 13 Series
Polyglycol 15 Series

Oxides:
Ethylene Oxide • Propylene Oxide
Butylene Oxides S • Styrene Oxide
Epichlorohydrin

The Polyglycols number many active members, among them three new products developed by Dow research—polyepichlorohydrin, polystyrene glycol, and polybutylene glycol. All three are adaptable as intermediates in the production of the new polyurethanes and in the surfactant field. Many promising applications also exist in the paint, petroleum, detergent, plastic industries.

The Polyethylene Glycols are available in twelve molecular weights from E200 to E20,000, and ranging from viscous liquids through waxy and hard tough solids. Very useful as plasticizers, lubricants, solvents and as carriers in cosmetic and pharmaceutical preparations.

The Polypropylene Glycols "P" series liquid through entire molecular weight range, P400 through P4000. Employed as lubricants, solvents, plasticizers and anti-foam agents. Polyglycol P2000 (resin grade) has gained widespread acceptance for use in urethane foams.

THE DOW CHEMICAL COMPANY • Midland, Michigan

DOW

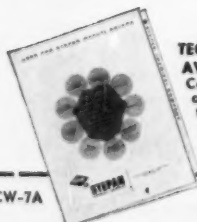
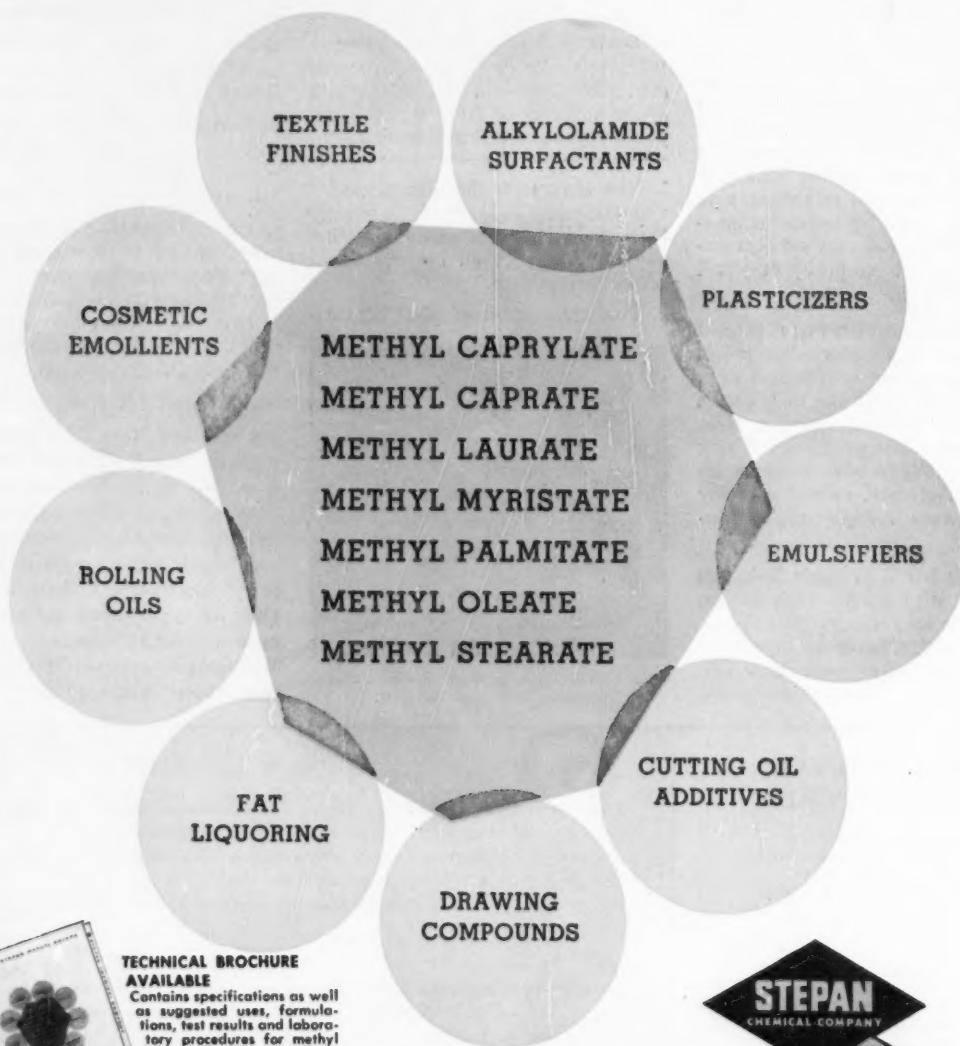
STEPAN METHYL ESTERS

OFFER IMPORTANT ADVANTAGES AS INTERMEDIATES OR ADDITIVES FOR A WIDE RANGE OF APPLICATIONS

Methyl esters offer a number of important advantages over fatty acids as intermediates. In most cases methyl esters are more reactive... offering cost savings from that standpoint. Further, they are more fluid and considerably less corrosive than fatty acids. Many reactions involving methyl esters can

be run in plain steel, eliminating the need for costly storage tanks and reactors.

The new Stepan plant at Millsdale, Illinois (near Joliet) is now producing in quantity a wide range of methyl esters of high purity and excellent uniformity. We would be pleased to furnish you with working samples, technical bulletin and prices.



TECHNICAL BROCHURE AVAILABLE

Contains specifications as well as suggested uses, formulations, test results and laboratory procedures for methyl esters in a wide variety of applications.

CW-7A

Gentlemen: Please send

☐ Technical Brochure ☐ Working Sample of

(Fill in particular esters)

Name

Firm Name

Address

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Zone State



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CHEMICAL COMPANY

427 West Randolph Street, Chicago 6, Illinois
Telephone: STate 2-4711

AMERICA'S MOST COMPLETE LINE OF SURFACTANTS

Business Newsletter

CHEMICAL WEEK
July 4, 1959

Food additive makers may have to "act swiftly" if they want to stay in business after the new food additives amendment takes effect next March 5.

That's the gist of a warning issued by the Food & Drug Administration's Arthur Checchi last week in Boston, at the annual conference of the Assn. of Food and Drug Officials.

Although nine months have passed since the amendment was approved, only 27 petitions—most of them containing insufficient data—have been submitted for clearance of tolerance limits, Checchi said.

Warning against a probable spate of formal petitions toward the end of '59, Checchi declared: "We will not, for the sake of expediency, issue a regulation authorizing use of an additive until we are thoroughly convinced . . . such action is wholly consistent with our obligations under the law."

FDA Commissioner George Larrick told the group that food radiation will also come under close scrutiny. The danger: high-radiation intensities may leave a radioactive residue. Under the Delaney cancer provision of the amendment, such food could not be cleared, no matter how little induced radiation is present.

A flurry of chemical mergers materialized last week.

- General Dynamics Corp. and Material Service Corp. (Chicago) boards voted unanimous approval of plans to merge through an exchange of stock. Shareholders will be asked to o.k. the move at special meetings. Material Service is a large producer of building materials, coal, lime, and mineral feeds. Its 1958 sales: \$114.4 million.

- UBS Chemical Corp. — chemical specialties maker — will merge with soybean processor A. E. Staley Manufacturing Co. (Decatur, Ill.) following last week's approval by UBS shareholders. Terms call for Staley to exchange one share of stock for each 1¼ shares of UBS.

- Rexall Drug & Chemical has just acquired Granada Plastics Co. (Saugus, Calif.), which went onstream last September with a 250,000-lbs./month polystyrene plant (*CW*, Sept. 20, '58, p. 89). Granada will serve as Rexall's West Coast polystyrene producer, supplementing Rexall subsidiary Seamco Chemical (Holyoke, Mass.), which turns out the plastic in the East.

- St. Regis Paper Co. last week filed a registration statement with the Securities & Exchange Commission seeking approval to issue new shares to acquire Chemical Packaging Corp. (Savannah, Ga.). Chemical Packaging makes and sells multiwall bags primarily for packaging of chemical fertilizers.

Business Newsletter

(Continued)

More top-level promotions—this time at Celanese Corp. A few days after the new appointments at Allied and Monsanto (p. 23), the Celanese directors elected Harold Blancke chairman and George Schneider vice-chairman—offices that have been vacant since the death of founder Camille Dreyfus in Sept. '56. Blancke will continue to serve as president and chief executive officer.

And Britain's big Imperial Chemical Industries will have a new chairman next March. Sir Alexander Fleck—who has headed ICI since '53—will retire Feb. 29. His successor: Finance Director Stanley Chambers.

For a good indication of how chemical business is holding up, look at Hooker Chemical's just-out report for the six months ended May 31: sales up 24%, to \$74.7 million; earnings up 34%, to \$7.6 million. Says Hooker: "Due to high operating rates as well as efficiency improvements made over the past two years, profit margins have increased although prices remained steady."

Navy's cancellation of a \$13.5-million sodium borohydride contract could mean a long period of taking stock of the government's entire high-energy fuel program—in which case there might be little or no new business in this field for a year or more.

It's understood that the Air Force is about to assign a contract for a detailed study of what's being done—research, production, processes, performance, costs, everything.

Metal Hydrides (Beverly, Mass.) is striving to drum up more commercial business to take up the slack; its contract to supply sodium borohydride for borane fuels production (in the Navy plant operated by Olin Mathieson at Model City, N.Y.) was abruptly terminated last week—10 months ahead of schedule. The company produces various hydrides and metal powders for industrial use, has a \$211,000 backlog in government research contracts.

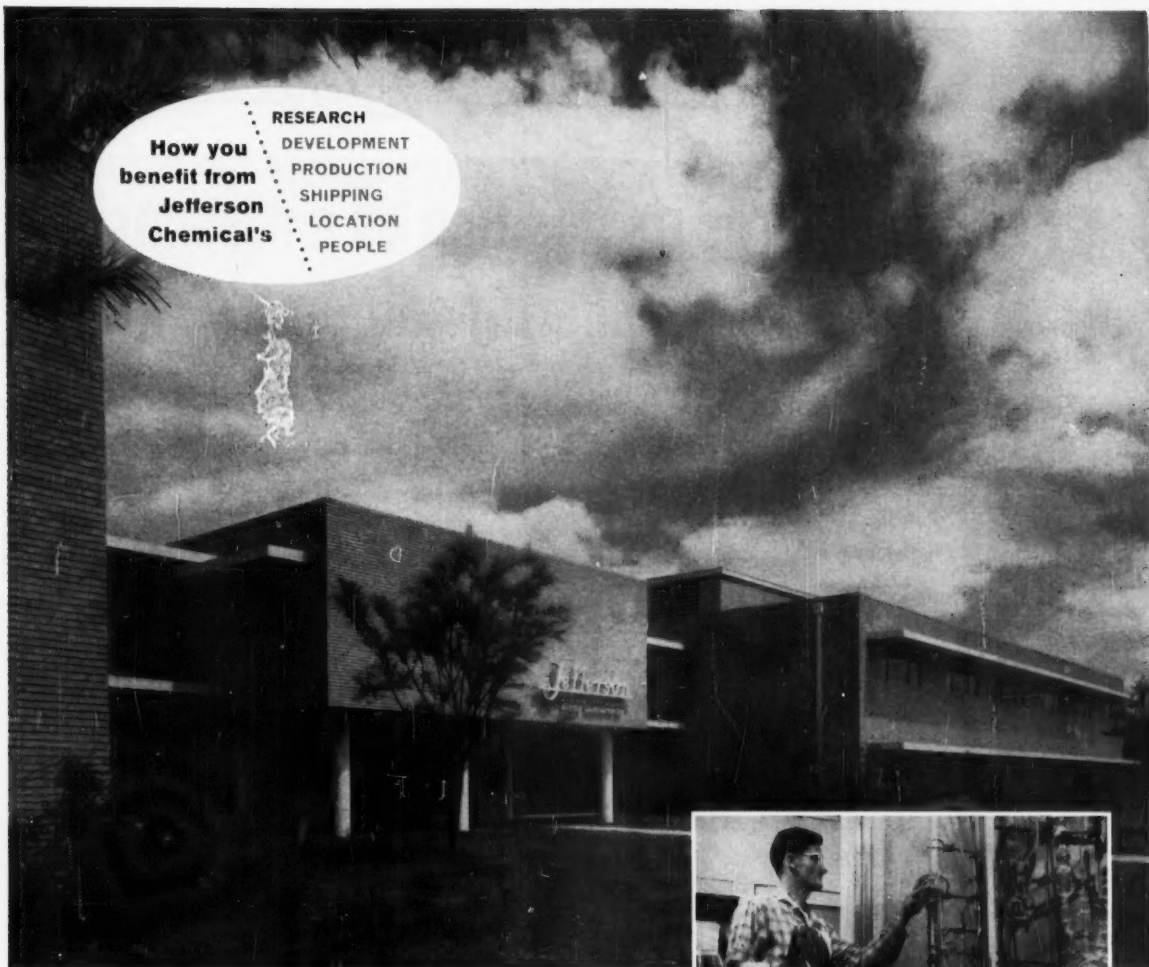
Increased U.S. chemical equipment sales to Russia are not likely to result from the current cross-country tour of Soviet Deputy Premier Frol Kozlov; but the Soviet bloc is putting out a feeler on getting Western know-how and equipment, as well as chemicals, from Canada.

Later this month, a delegation from Czechoslovakia's Ministry of the Chemical Industry will arrive in Canada to shop for \$2-10 million worth of such items as synthetic rubber, carbon black, pulp and paper equipment, along with technology to make rubber and carbon black.

A five-man Russian trade team recently left Canada after negotiating for a trade pact, which may be signed soon. Communist trade overtures have in the past met with some success in Canada, where both government and industry are relatively friendly toward Red bloc trade.

How you
benefit from
Jefferson
Chemical's

RESEARCH
DEVELOPMENT
PRODUCTION
SHIPPING
LOCATION
PEOPLE



This Jefferson plant processes questions and answers!

Jefferson's firm foundation for continuing growth in the dynamic petrochemical industry is vested in a vigorous and productive research organization. Located among the rolling hills of Austin, Texas, only a short way from the state capitol and spacious University of Texas, are Jefferson's modern research laboratories, pilot plant and semi-works facilities.

Here in pleasant functional surroundings, chemists and engineers are busily asking and answering *what* chemicals to make and *how* to make them better. Principal pursuits are Exploratory Research, Process Development and Application Research supported by analytical and physical chemical laboratories, library and machine shops. The lab-

oratory staff works hand-in-hand with the people who operate Jefferson Chemical's ever-expanding production facilities at Port Neches, Texas.

However, much of Jefferson's research is customer-oriented and closely coordinated with the Marketing Department. Your interests and most assuredly your personal visits are always welcome at Jefferson Chemical's Austin Research Laboratories.


JEFFERSON CHEMICAL
COMPANY, INC.

HOUSTON • NEW YORK • CHICAGO • CLEVELAND • CHARLOTTE • LOS ANGELES

July 4, 1959 • Chemical Week

19

West End earns its position as a responsible supplier of salt cake

In 1955, with its first offering of salt cake, West End assured the Industry of an ability to meet long-term commitments based on vast natural raw material supply, ample production and storage capacity, rapid and efficient transport facilities. By unconditional fulfilment of every commitment for over 4 years, West End has conclusively demonstrated its complete reliability as a major source of highest quality salt cake. Every normal and unanticipated requirement has been met with equal ease and dispatch.



Today, with even larger facilities and a determination to maintain the reputation it has earned, West End is solidly qualified to handle any size requirement in a wide marketing area where it is a logical source of salt cake for kraft paper manufacturers. You are invited to consult with us on the over-all economics of using West End Salt Cake.

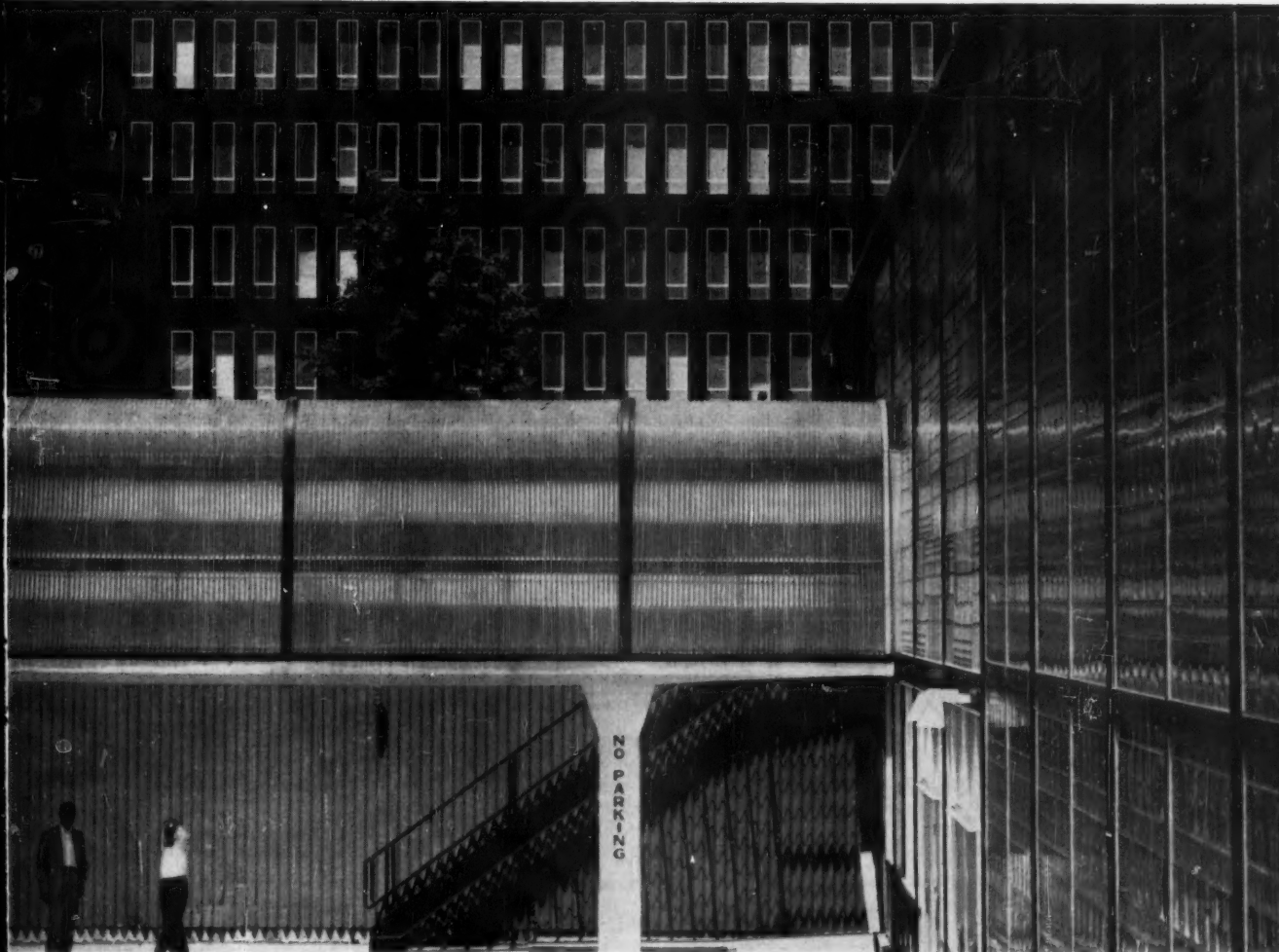
1959

WEST END



WEST END CHEMICAL COMPANY
DIVISION OF STAUFFER CHEMICAL COMPANY

EXECUTIVE OFFICES: 1956 WEBSTER, OAKLAND 12, CALIF. • PLANT: WESTEND, CALIF.



Trend to glass-wall buildings—like these of Corning Glass Works—helps boost chemical sales.

New Gleam in Glassmakers' Future

Although the glass industry has been harried since '57 by strikes, rising imports and continued sniping from antitrusters, prospects for the '60s are bright — thanks mainly to a huge spending program that will multiply capacity. If the industry's optimistic expectations materialize, chemical suppliers can look forward to snowballing demand for glassmaking raw materials.

Newest and most striking development along this line is a report that Libbey-Owens-Ford (Toledo, O.) plans to build a \$150-million flat glass

manufacturing plant in Stockton, Calif. (*CW*, June 27, p. 30). Most of the cost reportedly would be tied up in three giant \$30-million manufacturing machines.

L-O-F confirms that it has bought an 874-acre site 10 miles south of Stockton, but vigorously denies any immediate plans to build there. The report, given front-page treatment in San Francisco and other California cities, originated with the Stockton Chamber of Commerce—which, glass executives say, may have been somewhat overenthusiastic.

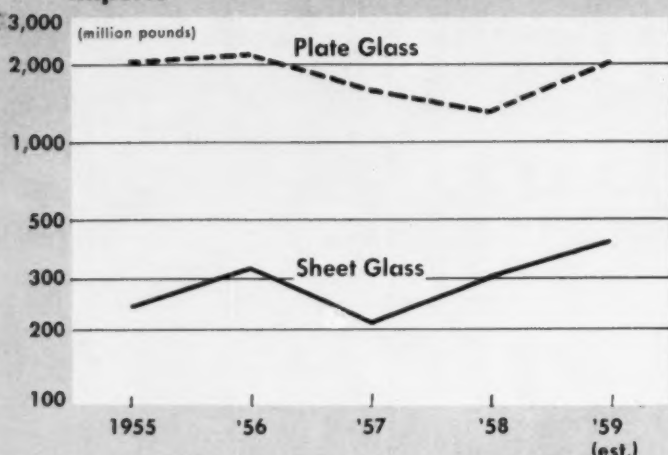
In any case, all agree that L-O-F has something big in mind for the new tract, though the plan may be a long-range one. But, say many observers, to build a \$150-million plant there would be "fantastic," judging from the present size of West Coast glass markets.

Less Conjecture: American-Saint Gobain Corp.'s plans are clearer. It will build a \$40-million plate glass unit somewhere in the Ohio River valley. The project should be completed in about three years.

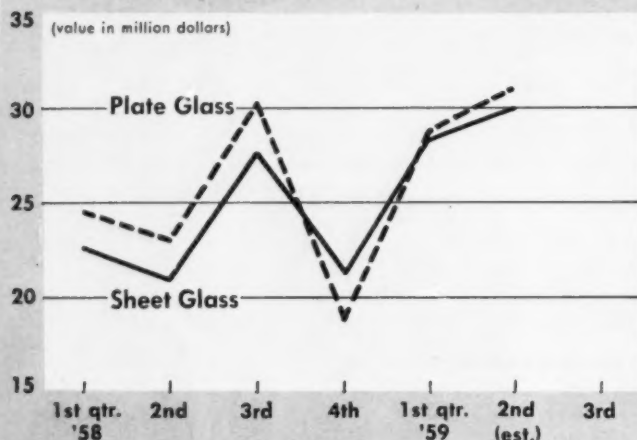
A board meeting was held last week

Flat glass on the upswing

Imports



Domestic shipments



in New York, where — it is reported — the company decided on a plan to finance the new unit. Likely upshot: both loans from insurance companies and a new securities issue are in the offing. Because of Securities and Exchange Commission regulations, the company cannot reveal details.

Noteworthy feature of this plant will be its cost-cutting twin-polishing technique, by which both sides of a glass sheet are simultaneously polished. Twin polishing was developed in France by Saint Gobain. A twin-polishing unit has operated successfully in Pisa, Italy, for two years. Another such unit is due to come onstream by late '59 at Chantierine,

France. So far, the U.S. does not have a twin-polishing plant, although big glassmakers report they're working on the process.

Pittsburgh Plate Glass, largest U.S. producer, is also building fast. Its new automated unit at Decatur, Ill., is expected to boost PPG's output of window glass by 15%. The company will bring in another, 350-employee fabricating and tempering plant at Crestline, O., by Aug. 1, and its glass fiber unit at Shelby, N.C., should be producing at full capacity by late '59.

Coming Up: Advances emanating from the industry's research labs add luster to the earnings outlook. Examples: a distortion-free laminated implosion window for television sets;

broader application for so-called "gray glass," now used in office buildings and homes to cut down glare; and possible home-heating use of glass coated with transparent, electrically conductive alloys (now used for deficing and defogging aircraft windshields).

Opportunity for Suppliers: The optimistic outlook reinforced by plans for new construction bodes well for chemical suppliers. A new plant, such as the proposed American-Saint Gobain unit—slated to turn out 40 million sq. ft./year of plate glass—will require 1.5 million tons of silica, 50,500 lbs. of alumina, 200,900 lbs. of calcium oxide, 88,150 lbs. of magnesium oxide, 272,650 lbs. of soda ash, and 4,100 lbs. of sulfur trioxide.

And, if other major projects, like the L-O-F California plant, materialize, both glassmakers and producers of glass chemicals may well chalk up record earnings in the '60s.

Higher Duties Ahead

U. S. chemical companies—which last year sold \$241.8 million worth of products to Canada — face higher tariff barriers in the next few years. And the Canadians' action may be based on how high the U. S. maintains its duty rates on made-in-Canada chemicals.

In preparation for the first Canadian tariff overhaul since 1906, a chemical industry committee has been studying recommendations.

Committee Chairman J. A. Davis recently told the chemical economics division of the Chemical Institute of Canada (Montreal section) that the committee has drawn up a definition — basic to the whole problem — of the chemical and allied products industries. It has decided to recommend the Brussels Nomenclature Classification System, which is used by most European nations (but not the U. S.).

The present system is felt to be confusing and contradictory. Lengthy administrative, and sometimes legal, proceedings have resulted from its differentiation between goods on the basis of whether or not they are of a class made domestically. And the same material is classified in different ways according to end-use. Simplification should help promote trade.

Pressures for Tariffs: But a boost in tariffs, of course, would have the

opposite effect. The committee is still in the preliminary stages of studying duty rates. It has submitted "guide-posts" to the industry, along with a request for recommendations.

Generally, Canadian chemical tariffs are lower than U. S. rates. Many items have been held duty-free to give new Canadian industries lower-priced raw materials. But such aid for some of these industries is no longer needed, and tariffs will probably be applied to at least some of these items.

Moreover, pressure for higher tariffs is likely to come from producers who seek large-scale markets. They would prefer to see U. S. tariff barriers come down. Failing that, they want to develop the Canadian market with the protection of higher barriers against U. S. imports.

The committee expects to submit its recommendations to Canada's Tariff Board about next February. The board's final proposals are expected to be ready for the '62 budget.

W. Virginia Potpourri

Look what's going on this week in a 65-mile strip between Charleston W. Va., and Portsmouth, O.:

- Montecatini — Italy's chemical heavyweight—has finally confirmed that its \$10-million polyolefins plant will be built on the 200-acre tract it purchased two years ago at Neal, W.Va., on the banks of the Big Sandy River. And—also as expected—Montecatini has started to revise upward the modest capacity rating originally announced for this plant.

Four weeks ago, Montecatini stated (in the prospectus for its \$10-million debenture issue) that the plant would have annual capacity of "about 5,000 metric tons of polypropylene," but added that "this quantity is subject to change as the development of the project proceeds." This week, speaking to community leaders at Huntington, W.Va., President Lucio Lucini of Montecatini's wholly owned Novamont Corp. said initial capacity is estimated at "slightly more than 10 million lbs. annually"—again "subject to change as the project proceeds."

- Ashland Oil & Refining—which is likely to supply the olefins for Montecatini's feedstock—is completing an aliphatic solvents and specialty

jet-fuels expansion at its Leach, Ky., refinery, just across the Big Sandy River from Montecatini's plant site. And Ashland's new gas concentration unit, to handle refinery gases from the catalytic cracker, is slated to start up within two weeks.

- Columbia Hydrocarbon Corp.—whose hydrocarbon fractionation plant at Siloam, Ky. (across the Ohio River from Portsmouth), went on-stream just two months ago—is earnestly seeking chemical and petrochemical customers for its ethane, propane and butane. Columbia is particularly interested in seeing these saturated hydrocarbons converted into the more chemically useful olefins—but apparently is not a strong contender for the Montecatini feedstock contract.

- Union Carbide—which early last year shelved a plan to build "a large new chemicals and olefins plant" on the Kanawha River about 20 miles northwest of Charleston, W. Va.—has just added 174.6 acres to that 400-acre tract. But Carbide says the project is still classed as "deferred," and adds that "the chemical products ultimately to be made may not be the same as those originally planned."

- Union Carbide's two-year-old Olefins Co. division—striving to build up a business as a major supplier of olefins and other hydrocarbons—has a small pumping station at Leach, Ky., just across the river from the Montecatini site; but Carbide states categorically that it will not be supplying olefins for Montecatini.

Meanwhile, the Olefins division is carrying out a sudden diversification into the lumbering business. It's starting up a highly automated, \$100,000 lumber mill at Sanderson, W.Va., 15 miles northeast of Charleston.

The division is making this move "to make money, primarily," a spokesman explained, adding: "But we also see an opportunity to create a training ground for scientific forestry and conservation practices." He said Carbide holds surface rights on about 43,000 acres of prime timberland in the area, and has now set aside 3,000 acres of this property as an experimental forest to be operated jointly by the company and the U.S. Forest Service. Of the hardwood lumber mill's 16,000 bd.ft./day output, some will be marketed, the rest will be used for Carbide's own material-handling needs, such as pallets, crating.

Olefin Output Boost

Banking on continuing growth in polyolefin plastics, Phillips Chemical Co. is preparing to expand capacity of its 180-million-lbs./year ethylene plant at Sweeny, Tex., by 75 million lbs. this year, and may be planning a further boost of about 45 million lbs./year in '60.

This would bring the Sweeny plant's rated capacity up to that of the company's purification unit at Pasadena, enable Phillips to meet peak requirements of its own and three other polyethylene plants—all on Phillips' 120-mile ethylene pipeline.

Much of the 75-million-lbs. expansion announced this week is destined for U.S. Industrial Chemicals, division of National Distillers & Chemical, which is completing one 75-million-lbs./year polyethylene plant at Houston this year and is planning another one—same site, same size—to be built later. Also, Phillips intends to expand its own 75-million-lbs. polyethylene plant at Pasadena (*CW*, April 25, p. 47). And Phillips is supplying ethylene to Celanese (also at Pasadena) and—on a smaller scale and a temporary basis—to Union Carbide at Seadrift.

As to the possibility of a further expansion next year or so, Phillips makes these points: this year's 75-million-lbs. expansion will handle requirements for only the "immediate" future; the entire plant is so built that additional expansion can be installed "readily"; and next year will bring another capital budget.

New Salt Plant

There's a new entry in the salt industry. Dakota Salt and Chemical Co.—subsidiary of General Carbon & Chemical Corp. (Lake Forest, Ill.)—is ready to start building a 50,000-ton/year plant on a 600-acre tract east of Williston, N.D.

Ralph Stover, president of General Carbon, said it would be the first new evaporative salt plant in the U.S. in 15 years and the nation's most northerly salt-producing unit. Output will be marketed in the northern mid-continent area.

Also Dakota Salt intends to develop underground storage caverns on the Williston site as a storage depot to serve bulk distributors of propane, butane and other hydrocarbons.

SPAWNING ANOTHER EUROPEAN MASS MARKET

| | | 1957 Population (millions) | 1957 GNP (billion U.S. \$) | 1957 Chemical Sales (million U.S. \$) |
|--------------------------------|---|----------------------------------|----------------------------------|---|
| "Little Free-Trade Area" | Austria Denmark Norway Portugal Sweden Switzerland United Kingdom | 90 | 90* | 4,715* |
| European "Common Market" | Belgium France Germany (West) Italy Luxemburg Netherlands | 166 | 145* | 9,952* |
| | U. S. | 171 | 440 | 23,427 |

*Estimated by CW, based on data compiled by Organization for European Economic Cooperation (OEEC).

New Market Area—Maybe

Late this month, seven European nations outside the "Common Market" — Britain, Sweden, Norway, Switzerland, Denmark, Austria and Portugal — will start ministerial talks to consider plans for a "Little Free-Trade Area." Their deliberations may have important repercussions for U.S. chemical companies — particularly those with investments in Europe, as well as for U.S. producers exporting to Great Britain and the Continent.

The plans, drawn up by a working staff last month in Stockholm, are being kept secret until final agreements are reached. But they are known to call for a 20% reduction of tariffs on industrial goods between member countries on July 1, '60, and a step-by-step elimination of tariffs within 10 years.

Britons See Gain: If the plan becomes a reality, one effect would be to create a large free-market area. Lowering internal tariffs would be of greatest benefit to British producers, who now face stiff competition from West Germany in the Scandinavian countries.

But, in itself, the "Little Free-Trade Area" would be far less important industrially than Euromart. In size, it

is much smaller than Euromart (see table, above). And its provisions are much more modest. It would not include a common outside tariff wall, nor the economic and political bodies that are designed to weld the Common Market into an integrated industrial complex, and, ultimately, into a political federation.

The most important result of this association of the "outer seven" (and its real purpose) would be to give them a united front in bargaining for Common Market trade concessions.

Larger Unit Wanted: This is why the Federation of British Industries, after months of deliberation and debate, has come out for the new association, urging that it be given a form that "will as far as possible assist the negotiation of an acceptable association with The Six."

But hopes are not dead for ultimate formation of a 17-nation Free-Trade Area, the plan that was vigorously pushed by Britain and scuttled by the opposition of French protectionists. (Much of this opposition came from the French chemical industry, which, unlike the German, is in an unfavorable competitive position against England.) But the min-

isters of the "outer seven" must still straighten out some snags.

U.S. producers with plants in Europe would, of course, share in the benefits of bigger markets if the Free-Trade Area or half-way measures came about. Producers in Britain would also enjoy the benefits of Commonwealth preference. But producers in the U.S. might find the pressures getting heavier for a reduction of U.S. tariffs. Trade unity in Europe would strengthen the hand of European bargainers at next year's GATT tariff-cutting session. It would also promote European independence of U.S. products.

Changes at the Top

Two top-level promotions were revealed last week by Allied and Monsanto.

Allied Chemical's board of directors chose Chester Melville Brown (born 1907 in Cape Girardeau, Mo.) to become president of the corporation this September, when incumbent Glen Miller is due to retire.

And Monsanto Chemical's board has elevated Charles Sommer (born 1910 in St. Louis) to the post of executive vice-president—ranking directly under Board Chairman Edgar Queeny and President Charles Allen Thomas. Monsanto has not had an executive vice-president the past three years. Thomas had held that office four years prior to his election to the presidency in April '51.

The new lineup at Allied will be headed by Kerby Fisk, chairman of the board and chief executive officer; Harry Ferguson, chairman of the executive committee and chief administrative officer; and President Brown, who will be the company's chief operating officer.

Brown—a 30-year Allied employee—has been serving as president of the National Aniline Division and previously was president of the General Chemical Division. He was tagged as a likely candidate for the Allied presidency several months ago (CW, April 11, p. 62).

Sommer has been with Monsanto 25 years, serving since '54 as a corporate vice-president and general manager of the Organic Chemicals Division. Before that, he headed Monsanto's former Merrimac Division at Boston for three years.

COMPANIES

Thiokol Chemical is now negotiating a possible merger with Pacific Engineering and Production Co., which has been producing ammonium perchlorate at Henderson, Nev., since early this year (*CW Business Newsletter*, Feb. 28). Thiokol—a major producer of rocket engines and propellents—says it's interested in acquiring the Nevada company as a source of perchlorate.

Olin Mathieson will turn the Morgantown, W.Va., Ordnance Works back to the federal government July 15. The General Services Administration has hired 30 former OM employees to take charge of the idle plant and do necessary maintenance work. OM discontinued production of ammonia and other fertilizer materials at this plant last year, explaining that operating costs were too high.

Texaco and Superior Oil managements have agreed on a proposal for merging the two companies. Their plan—which calls for exchanging 24 shares of Texaco stock for each outstanding share of Superior common—will be submitted to both companies' boards of directors and to Superior's stockholders.

EXPANSION

Plastic Film: Dow Chemical has purchased a vacant 12-year-old factory building in Findlay, O., and plans to convert it for production of polyethylene film. The plant occupies about 208,000 sq. ft. on a 27-acre site. Dow's Dobeckmun Co. Division will share production planning and engineering duties. Initial employment is expected to be about 100.

Maleic Anhydride: Reichhold Chemicals Inc. (White Plains, N.Y.) has awarded a contract to Badger Mfg. Co. for engineering and construction of a \$4-million maleic anhydride unit adjacent to Reichhold's existing plant at Elizabeth, N.J. Capacity: 20 million lbs./year. The new plant—one phase of Reichhold's \$24-million expansion program for 1958-60—will use RCI's own process, involving catalytic oxidation of benzene, azeotropic dehydration, and direct condensation from the gas stream. Onstream date: June '60.

Petroleum Products: A 20,000-bbbl./day petroleum refinery is scheduled to be added to the growing petrochemical complex in Orange County, Texas. Under an agreement between National Gas Liquids Corp. (Houston) and the Orange County Navigation and Port District, the latter will issue \$4.5 million worth of revenue bonds to acquire a 92-acre plant site, improve port facilities, erect oil storage tanks, and provide foundations for refinery installations. Then

NGLC will put up about \$6.5 million worth of equipment to process oil barged in from Gulf Coast wells. Anchor Oil Co. (Tulsa, Okla.) has contracted for the first 10 years' output of high-octane gasoline, which will be the new refinery's principal product. Rental to be paid by NGLC will include annual amortization costs of the bond issue.

Melamine: Reichhold Chemicals is planning to build a multimillion-dollar melamine plant "somewhere in the South." The plant is due to begin operating early in '61 with initial capacity of 20 million lbs./year, but RCI says it will be designed for eventual expansion to 50 million lbs./year.

FOREIGN

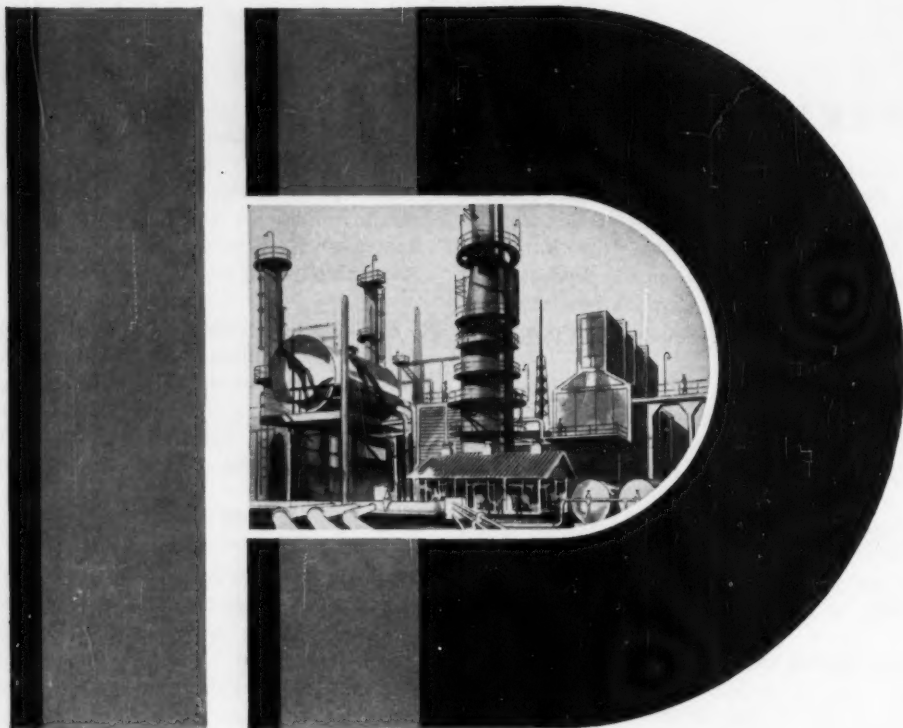
Rubber/Poland: Poland—trying to expand output of synthetic rubber to 20,000 metric tons/year in 1960 and 50,000 by '65—has just signed contracts to sell \$2 million worth of motor vehicle tires to Yugoslavia, smaller quantities to Finland and Turkey.

Investments/India: The Indian Credit and Investment Corp. and the U.S. government's Technical Cooperation Mission are reported near agreement on a plan to set up an Indian investment center, with offices in New York and Washington. The proposed center would advise U.S. industrialists on investment opportunities, tax and business laws in India.

Polyethylene/England: Monsanto Chemicals Ltd. has started producing high-pressure polyethylenes at an initial rate of 10,000 tons/year at its new Fawley plant, near Southampton.

Naval Stores/Mexico: Heyden Newport Chemical Corp. (New York) and Resinera Uruapan, S.A., Mexican naval stores producer, have formed a new joint subsidiary to produce gum rosin in the del Tigre Region, near Guadalajara, some 300 miles northwest of Mexico City. The new company's name: Resinera del Tigre, S. de R.L. de C.V. Heyden President Simon Askin reports that a line of derivative chemicals stemming from rosin and turpentine eventually will be produced.

Aluminum/England: Aluminum Co. of America (Pittsburgh) and Imperial Chemical Industries (London) are planning a new aluminum fabricating concern to be known as Imperial Aluminium Co., Ltd. It would be owned 51% by ICI, 49% by Alcoa. Principal assignment: to operate ICI's expanded and modernized aluminum rolling mill and extrusion plant at Waunarlwyd, South Wales. The joint venture would begin Aug. 1, provided it is cleared by the British Treasury.



LP&L proves feasibility of computer process control--buys second computer system

Here's important news for everyone interested in automatic process control. After one year's operational experience with a Daystrom computer operating on-line at its Sterlington Steam Electric Station, Louisiana Power & Light Company has purchased another Daystrom system. This new digital computer will provide completely automatic control for LP&L's new 230,000 kw Little Gypsy Station. The techniques inherent in the LP&L installations are directly applicable to the requirements of the process industries.

The original Sterlington installation, delivered over a year ago, came about through the combined engineering efforts of Louisiana Power & Light Company, Ebasco Services, Inc., design and consulting engineers for LP&L, and Daystrom Systems.

The Sterlington computer system performance has demonstrated for the first time the reliability and utility essential to the stringent requirements of overall control responsibility. This field operating experience permits Daystrom to

guarantee system operational availability of more than 99%. The uncompromising criterion of design which makes this performance possible dictates the complete elimination of vacuum tubes and moving parts.

The Little Gypsy computer system will perform the following functions: (1) Control sequentially the 800 or more steps necessary for plant start-up and shut-down, continuously checking the overall progress of the operation; (2) Monitor at the rate of ten times per second the hundreds of electrical signals signifying plant operating conditions and safety; (3) Instantly recognize abnormal conditions and take appropriate corrective action automatically; (4) Control combustion, feed water and steam temperature for best efficiency.

A substantial number of these systems have already been purchased for performance data reduction and automatic control. The availability of these new techniques and associated equipment to the process industries warrants your careful study. For conference

arrangements, write or telephone Daystrom Systems, Dept. A-112, Miramar Road, La Jolla, California. GLencourt 4-0421.



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Washington Newsletter

CHEMICAL WEEK

July 4, 1959

A step-up in air-pollution control funds is well on its way through Congress.

But legislators are not likely to give the Health-Education-Welfare Dept. the authority it seeks to hold local hearings and make recommendations.

The Senate-approved bill now before a House committee extends the air-pollution control bill for four more years and steps up annual expenditures from \$5 million to \$7.5 million. Most of the increase would be spent for research on automobile exhaust. Also due for increased attention would be the establishment of university courses for training technical people, and basic research on pollution instrumentation and control methods.

The increased fund authorizations were sought on the basis of recommendations made by last fall's national conference on air pollution.

•
Proposals to tax nonprofit scientific laboratories have been delayed indefinitely by the Internal Revenue Service.

IRS had proposed that tax exemption be removed from the nation's 52 nonprofit labs (e.g., Battelle, Mellon and Armour institutes) unless the labs engage only in basic research and publish their results. The labs protested that while they do "some" commercial applied research, it is often impossible to separate applied from basic research. They also asserted that the Treasury already has the right to tax that portion of a lab's income that comes from commercial work.

The American Council of Independent Laboratories has been working for years to remove the exemption on nonprofit labs, claiming that 94% of the \$115 million worth of work done by these institutes is commercial, and results are not disclosed to anyone but the commercial sponsor. In other words, ACIL says, nonprofit labs are in direct competition with the 600 or so commercial labs but enjoy tax exemption. The National Science Foundation's most recent information indicates that half the labs' work is for federal government and less than 20% for commercial purposes.

•
The government will try to define tax-exempt research "at another time," says IRS Commissioner Dana Latham.

•
The helium plant at Shilprock, N.M., will reopen this month, using gas pipelined eight miles from a Pan-American Petroleum Corp. gas well. The Bureau of Mines' plant has been idle since October, when gas in the area gave out.

Anticipated helium output will be 3.5 million cu. ft./month, equal to about one-tenth of the bureau's total production at Amarillo and

Washington Newsletter

(Continued)

Exell, Tex., and Otis, Kan. The new helium plant at Keyes, Okla., to be completed in August, will produce eight times the volume of the Shiprock plant.

The bureau will ask Congress later this session to authorize a long-range helium program. This would authorize construction and operation of 12 additional plants.

Here's more on a nuclear blast to produce oil from oil shale.

The Bureau of Mines will invite chemical and petroleum companies to a meeting soon for further talks on the question. No date has been set. The two industries were polled recently to determine whether enough companies are willing to help pay for a test blast in the Colorado oil-shale deposits. Out of 21 responding, all but two favored a test and several are willing to help foot the bill.

And the companies, generally, do not think that a small experiment using conventional explosives should be conducted first. The Atomic Energy Commission, working with the Bureau of Mines, is hopeful the experiment can be scheduled for next spring.

The Senate has moved to ban import of Soviet science equipment for U.S. school laboratories. The ban—a "rider" on an appropriations bill—may stick when the bill goes to conference with the House.

The Senate measure stipulates that no school district receiving funds under the National Defense Education Act may spend them to purchase Soviet equipment. The sponsors claim the U.S.S.R. is deliberately underselling American manufacturers to undermine the industry and score a propaganda victory with school children. The administration is solidly opposed, partly on the grounds that this is federal interference in local school administration.

Eisenhower's cut-the-spending pleas had no effect on the Senate when it came to funds for medical research. Senators upped the House-approved appropriations by \$136 million—to a total of \$480 million. Ten Republicans joined 60 Democrats to beat down GOP leader Everett Dirksen's effort to trim research money.

Latest skirmish over stockpile policy came last week, when the House Appropriations Committee cut back Office of Civil and Defense Mobilization funds requested to complete incentive purchase programs for copper, nickel, and other items for the stockpile.

The contracts were long-term arrangements, signed when these and other minerals were in short supply and Washington wanted to stimulate domestic production. They are called "put-clauses." Most have run out, but OCDM told Congress it needed \$287.3 million to wind them up this year. The House committee said this is too much, and cut the OCDM requested appropriations back to \$100 million.

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MARKETS

Butyl Hopes Ride on Tire Sales

CPI marketers will keep a close eye on butyl rubber during the next few months as a result of Esso's recent introduction of butyl rubber passenger car tires. Rubber producers will be watching to see how effectively the company's new marketing campaign will boost butyl consumption.

Esso's new tire, tradenamed Atlas Bucron, is produced by two large tire manufacturers — U.S. Rubber and Firestone. Initial sales will be through the Esso auto service stations. Atlas Supply Co. — in which Esso and four other oil companies have part interest — will handle the distribution. At present, Atlas will supply Esso stations in the 18-state area from Maine to Louisiana (although it's expected that the other oil companies, for which Atlas is a distributor, will also handle the new tire).

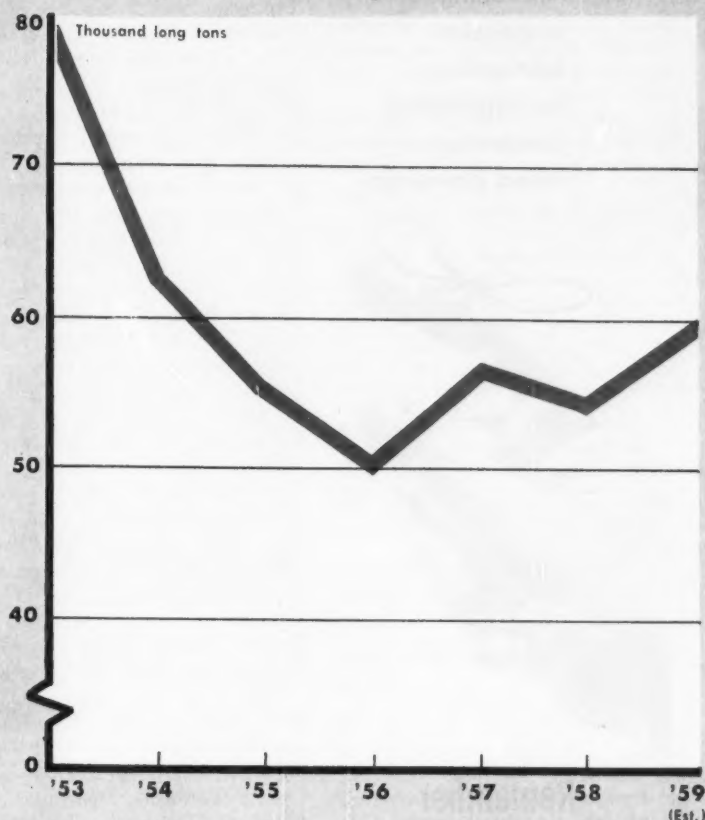
Meanwhile, the Enjay Co. Inc., which markets butyl throughout the U.S., is actively promoting Bucron to car makers, tire manufacturers and independent tire distributors. While the main interest now is in the passenger car market, butyl is approved by the Army for use in military truck tires.

Although tire costs are difficult to compare (because of the many grades and makes), butyl tires are reported to be about 20% more costly than a standard-type synthetic, but still less expensive than the so-called premium types.

Despite butyl's advantages, it will face tough competition from other synthetic tires and sales resistance from tire manufacturers themselves.

Tire producers now have more than ample synthetic rubber capacity to take care of their requirements. A widespread switch to another type of synthetic would mean idle plant capacity. And although the price of butyl on the open market is competitive with that of other synthetic rubbers, tire manufacturers' costs would still be higher because they must go to an outside supplier for raw materials. One observer points out, "At least we're sure of our present supply of synthetic," while butyl availability is uncertain. He's thinking, of course, about the

Butyl rubber consumption starts comeback



The record on butyl rubber

| (All figures in long tons) | | | | | | |
|----------------------------|------------|---------|--------|-------------|--------|--------|
| Year | Production | Imports | Supply | Consumption | Export | Stocks |
| '53 | 78,538 | 1,263 | 79,801 | 77,826 | 237 | 24,866 |
| '54 | 58,087 | 715 | 58,802 | 61,464 | 2,831 | 19,267 |
| '55 | 55,291 | 888 | 56,179 | 53,991 | 9,895 | 10,500 |
| '56 | 74,988 | 934 | 75,922 | 49,581 | 8,699 | 28,685 |
| '57 | 66,936 | 522 | 67,458 | 55,813 | 8,835 | 31,489 |
| '58 | 52,241 | 1,872 | 54,113 | 53,432 | 13,793 | 18,770 |
| '59* | 22,977 | 731 | 23,708 | 21,060 | 4,986 | 12,496 |

Source: Rubber Manufacturers Assn. * First four months of '59.

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MARKETS

limited worldwide capacity of butyl.

World Capacity Small: Total world capacity of butyl rubber is only about 140,000 long tons/year; all of it comes from four producers. Two, in the U.S., are owned by Esso Standard Oil Co. The largest plant, at Baton Rouge, La., is operated by the parent company, has a capacity of 47,000 tons/year. Humble Oil & Refining Co., a subsidiary of Esso, operates a plant at Baytown, Tex., which has a capacity of 43,000 tons/year. Feedstock for both units is supplied from nearby Esso refineries.

The Canadian government owns Polymer Corp., only other producing facility in the Northern Hemisphere. It's located in Sarnia, Ont., has a capacity of 30,000 tons/year. (Incidentally, a strike, which began last March 19, has shut down plant operations and cut off all imports from this source during the past three months.)

In France, a group of companies interested in the butyl business merged under the name of Societe du Caoutchouc Butyl (Socabu) and recently completed building Europe's first butyl facility. The plant is located at Notre-Dame de Gravenchon, near Le Havre (France), has an annual capacity of 20,000 long tons.

The French group's process for the production of butyl was licensed from Esso, which also supplies the raw material—isobutylene—from its nearby refinery at Port Jerome, France. (Butyl rubber is a high-molecular-weight copolymer consisting of 97-99.5% isobutylene, with isoprene making up the difference.)

Thus, it's clear that any sudden and large demand for butyl in the U.S. would call for additional capacity. Meanwhile, Esso's plants, now producing at less than full capacity, could handle some additional demands for butyl.

Butyl Sales Moving Up: Prior to '54, the big market for butyl was in the manufacture of inner tubes; this outlet accounted for 95% of all butyl consumption in the U.S. However, with the switch-over to tubeless tires on '55 model cars, butyl consumption dwindled, reached a low of 49,581 tons in '56. The decline actually started in '54, when production of tubeless tires began (see chart p. 31). Consequently, Esso started placing more emphasis on the nontire uses for butyl, which today provide a rapidly grow-



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Primary amyl alcohol is useful as an intermediate for ore flotation reagents, plasticizers, di-ester-type lubricants, fuel and lube oil additives, resin catalysts, vinyl stabilizers, corrosion inhibitors, and surface-active agents. It can be the reaction solvent in preparation of penicillin salts, and a wash in their purification. This mixed isomer also is used as a coupler and latent solvent for nitrocellulose lacquers.

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| | |
|---|---------------------|
| Purity, as Primary Amyl Alcohol, wt. % | 98.0 min. |
| Acidity, as Acetic Acid, wt. % | 0.01 max. |
| Carbonyl, as C ₆ aldehyde, wt. % | 0.20 max. |
| Water, wt. % | 0.3 max. |
| Apparent Specific Gravity, 20/20°C. | 0.8134 |
| Boiling Point, °C. | |
| 760 mm. Hg | 133.1 |
| Freezing Point, °C. | -90 (sets to glass) |
| Solubility in Water at 20°C., wt. % | 1.7 |
| Solubility of Water in at 20°C., wt. % | 9.2 |
| Viscosity, cps. | |
| 0°C. | 8.5 |
| 20°C. | 4.3 |
| 40°C. | 2.4 |

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MARKETS

ing outlet. For example, between '55 and '57, consumption of butyl in non tire uses doubled, from 6,000 tons to about 12,000 tons/year. During '58, small market gains were made, but projected consumption in '59 is expected to be over 15,000 tons. Average consumption of butyl rubber per passenger tire is in the 10-12-lbs. range.

Inner-tube sales — although not comparable to sales in pretubeless days—are also holding up. Last year, 40 million butyl tubes were manufactured. Part of the demand is due to the use of tubes in tubeless tires when they become old or damaged.

There's little doubt that these markets for butyl will continue to show steady growth, and the bright expectations mean significant new butyl rubber expansions in the next few years.

Rubber Chemicals Off

Total U.S. output of rubber-processing chemicals amounted to 169 million lbs. in '58—9% less than the 186 million lbs. made in '57.

Reason for less production, according to a preliminary report by the U.S. Tariff Commission, was the reduced output of cyclic accelerators and antioxidants.

Sales of rubber-processing chemicals also declined in '58—123 million lbs. (worth \$80 million) vs. 132 million (\$85 million) in '57.

Output of cyclic materials (chiefly accelerators and antioxidants) totaled 144 million lbs. in '58, compared with 156 million in '57. Sales were 103 million lbs. (valued at \$67 million), in '58 and 110 million lbs. (\$70 million) in '57.

About 74 million lbs. of antioxidants (including 33 million lbs. of amino compounds, 12 million lbs. of hydroxy compounds) were made in '58.

Production of acyclic rubber-processing chemicals—mainly accelerators and peptizers—amounted to 25 million lbs. in '58, compared with 30 million in '57. Sales of acyclics totaled 20 million lbs. (worth \$13 million) in '58 and 22 million lbs. (worth \$14 million) in '57. The '58 production breakdown: accelerators, 13.4 million lbs.; blowing agents, 309,000 lbs.; peptizers, modifiers, conditioning and lubricating agents, 11 million lbs.



Another success story of Shawinigan acetal resins magnet wire insulation

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This is just one illustration of how acetal resins are being used to advantage in industry. These versatile resins might be the answer to your product improvement problem.

Polyvinyl acetal resins, Butvar (polyvinyl butyral) and Formvar, are unusual polymers because they contain three different functional groups distributed in the molecular chain. Available in a variety of molecular weights and chemical compositions, the acetal resins are compatible

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PRODUCTION



Niagara's electric furnaces and other electrochemical units will lose low-cost 25-cycle power.

New Problems for Niagara Power Users

To the men pictured here tapping an electric furnace, and to others in Niagara Falls' many electrochemical plants, large quantities of low-cost electric power are the lifeblood of their jobs. And to the companies for whom they work, developments in the past few weeks are bringing mixed emotions in the area's multi-million-dollar struggle for new power supplies to keep the plants alive.

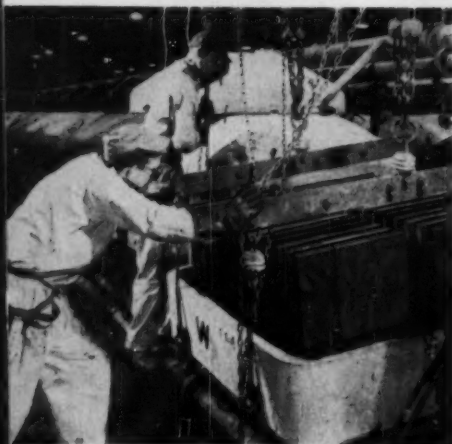
The plants have just learned exactly how much 60-cycle power they'll get—and at what approximate price—to replace 25-cycle power, when the state power authority's Niagara Power Project is completed. The revelations

from Niagara Mohawk Power Corp. (*CW Technology Newsletter*, June 6) came three years, almost to the week, after the rock slide, which destroyed the area's major source of 25-cycle power at the Schoellkopf generating plant.

Since that time, several plants have reached the halfway point in mammoth, complex projects for conversion from 25 to 60 cycle. Others are well beyond the halfway point. But still others have barely begun to convert. To operating management generally, there's small satisfaction over the news that the 373,000 kw. to be received by Niagara Falls plants is

one-third more than the 25-cycle power these plants received from Schoellkopf and Adams generating plants, and that the 72,000 kw. to be received by plants outside Niagara Falls is equal to the 60-cycle power installed at Schoellkopf before the slide.

Pushed In: While 25-cycle power has been unavailable for expansion at many plants for some time, and replacement of older plant equipment was inevitable, the need for power conversion has pushed the plants into large capital outlays—some of which might never have been incurred. And, for electric furnace operators, 60-



What power conversion will cost typical plants

| | Major power usage | Power allocation | Cost of conversion | Total, including modernization, expansion |
|----------------------|-------------------|------------------|-------------------------|---|
| Carborundum | electric furnace | 18,100 kw. | \$5 million | |
| Du Pont | electrolytic cell | 36,700 kw. | not available | over \$3 million |
| Hooker Chemical | electrolytic cell | 44,500 kw. | over \$1 million | |
| Titanium Alloy Mfg.* | electric furnace | 6,100 kw. | \$1.5 million | |
| Olin Mathieson | electrolytic cell | 21,300 kw. | \$1 million (est.) | \$9 million |
| Stauffer Chemical | electrolytic cell | 6,300 kw. | \$1 million (est.) | \$2 million |
| Union Carbide Metals | electric furnace | 118,100 kw. | over \$2 million (est.) | |

*Division of National Lead.

cycle power actually has a drawback: its higher reactance means higher electrical losses in lines and bus bars.

Union Carbide Metals, which has been operating partly on 60-cycle power since '51, points out that an economic balance can be worked out to determine whether it is better to live with the greater electrical losses or make equipment rearrangements. But Carborundum contends that one change leads to another—and conversion costs may go skyrocketing (see table, above).

One plan considered by many of the electric furnace plants — e.g., National Lead's Titanium Alloy Manufacturing Division: receive 60-cycle power, convert it into 25-cycle at the plant for furnace use. But 25-cycle equipment is more difficult and more expensive to obtain, particularly since Toronto, Can., one of the last 25-cycle strongholds, has converted to 60-cycle. Estimates place much of the 25-cycle equipment at 25% higher costs than 60-cycle. Moreover, even if a plant tried to retain 25-cycle power within the plant, it would ultimately face the 60-cycle conversion problem on plant expansions.

Direct-current power might have been tried, but load variations caused by withdrawal and re-entry of furnace electrodes left use of direct current open to question.

Rectifier Choice: Electrolytic cell processes, which use direct current, aren't faced with operating technique changes in conversion as are the electric furnace processes. Rectifier changes to obtain direct current are costly. For example, Hooker Chemical says much of its "over \$1 mil-

lion" conversion cost is in four silicon rectifiers that will deliver 17,280 kw. of direct-current power. They'll boost Hooker's conversion to 60-cycle power to 75%.

At Hooker, as at several other plants, the new rectifiers will replace rotary converters. Although these converters have long since paid for themselves, most of them still have considerable useful life. There's little market for them these days.

Attesting to the rapid development of silicon rectifiers, both Hooker and Stauffer Chemical picked them as replacements. Until two or three years ago, mercury arc rectifiers were considered best for high-voltage operations. Germanium rectifiers had hardly made their appearance. Now, silicon rectifiers have replaced germanium.

Reports on silicon rectifiers indicate they have been trouble-free so far. There has been dissatisfaction in some quarters with mechanical rectifiers. "After all, they do have moving parts," says one engineer. Nevertheless, Du Pont has picked mechanical rectifiers for its conversion. Olin Mathieson hasn't yet made a choice.

Don't Disturb: Du Pont cites one of the big problems of the conversion. The new 60-cycle system must be installed without disturbing the existing 25-cycle equipment. Part of the job: setting up a parallel system for more than 1,000 motors. Carbide Metals says that, even with this restriction, the new 60-cycle system at its plant involves little compromise, is designed much as it would have been if started from scratch.

Like several other companies, Du

Pont finds it difficult to break out the actual cost of conversion, since it is carrying out a large-scale plant modernization at the same time. Olin Mathieson is in the midst of converting, will later modernize its cell facilities at a cost of about \$9 million.

Stauffer, which is expanding as well as converting original plant facilities to 60-cycle power, points out that, although it has been using some 60-cycle power for 10 years, it will have to beef up its existing facilities to meet the increased load of 60-cycle power. It will be taking power at 115 kv., stepping down to 13.8 kv. for plant use. This means new switchgear, transformers, circuit breakers and high-voltage feeders in addition to silicon rectifiers for converting into direct current.

Food Machinery and Chemical's Becco Division prefers not to comment on its conversion plans. But it is believed to be facing a tougher problem than some firms. Reportedly, the Becco plant went through a modernization program a few years before the Niagara rock slide.

Higher Rates: The expensive conversion projects aren't the only points of Niagara disenchantment. Power rates will be going up, according to reports. While power contracts are complex (e.g., most plant contracts call for (1) hydro power, (2) allotted power, and (3) other than hydro power, received at various rates), many are receiving large quantities of 3-mill power, other quantities at about 6.5 mills.

The state power authority is expected to supply Niagara Mohawk with power at about 4 mills. To this,

Niagara Mohawk will add a "wheeling charge" — the charge for putting the power over its lines. This will bring power costs closer to 5 mills (probably around 4.8). In addition to hydroelectric power, some steam-generated power is being used. And the steam rates are generally considered high by the Niagara area companies.

Most companies decline to comment on power costs. But Carborundum, in a recently published survey of the area (*CW Business Newsletter*, June 20), had this to say about electric power:

"This area originally attracted electric furnace plants because 25-cycle power was abundant at competitive rates. The increases in electric power rates and the gradual discontinuance of 25-cycle power have imposed high capital and operating costs on existing electric furnace plants and [the area] holds little attraction for new electric furnace plants.

"The state power authority project, while offering many other benefits to the area, and while offering adequate volume of power when completed, will not offer competitive rates for large-volume electric furnace operations. The costs being incurred in the project will result in noncompetitive power rates for large-volume consumers of electric power."

A few companies cautiously say that power rates will still be lower than in many other sections of the country. And a few companies indicate that they may continue expansion in the area. But the conversion bill they are paying has chilled their enthusiasm.

New Pump Design

Absence of moving parts is a key feature of a versatile new positive-displacement pump offered by Crossley Machine Co. (Trenton, N.J.). Among the materials that can be pumped by the unit: molten metals (up to 2,000 F), acids, abrasives, or, says the firm, "any substance that will flow."

The pump operates on air pressure which empties each of three gravity- or force-fed cylinders consecutively. Air charge is switched from one cylinder to the next by a timing-control system. Turbulence on the liquid surface is minimized by a free-floating piston, which also serves to center a ball check-valve that keeps liquid out

of the air line, air out of the liquid line.

Capacity of the initial model is 100 gal./minute of water, can be varied by changing air pressure and size of inlets and outlets.

Since all contact surfaces are stainless steel and no lubrication is required, maintenance is kept to a minimum. And the pump need not be shut down for occasional replacement of parts, since two cylinders can continue pumping while the third is being serviced.

EQUIPMENT

Corrosion Inhibitor: The Armour Chemical Division (1355 West 31 St., Chicago 9) is offering a new fatty-nitrogen-derived corrosion inhibitor for use in hydrochloric acid to protect various metals, including stainless steel (316 and 420), Monel, bronze and mild steel. Called Armohib 28, the inhibitor is said to be effective in 5, 10 and 15% hydrochloric solutions over a wide range of temperatures, will not precipitate in the presence of ferric ions.

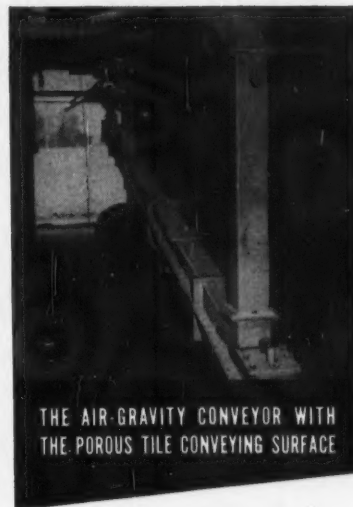
Glass-Window Housings: Adalet Manufacturing Co.'s (14300 Lorain Ave., Cleveland 11) cast aluminum-alloy explosionproof instrument and meter housings are now offered with glass windows. Six sizes accommodate instruments and meters from 3½-in. round to large GE AB18 and DB18 and Westinghouse K24 types.

Vibration-Absorbing Pad: Lowell Industries, Inc. (Boston 34), is out with a new pad that will absorb 90% of the destructive vibration and noise of machines. The pad, made of elastomeric vinyl, reinforced with monofilament fiber glass, has a 7,500-psi. breaking strength, is recommended for machines weighing 100 lbs. to 100 tons.

Water Purifier: A new water-purification system for delivering 20-million-ohm, ultrapure water is available from the Permutit Co. (50 West 44th St., New York 36). The packaged system operates on a closed circuit, takes water from a rinse cycle at elevated temperature, processes it through temperature reduction, filtration, ion exchange and returns it to use at original high temperature and purity.

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Technology

Newsletter

CHEMICAL WEEK

July 4, 1959

Construction of a \$29-million atom smasher got under way last week at Argonne National Laboratory. The 200-ft.-diameter, doughnut-shaped machine—dubbed the Zero Gradient Synchrotron (ZGS)—will become a key facility for high-energy physics research into the composition of matter. By smashing target atoms with protons accelerated to 12.5 billion electron volts, the ZGS will produce all of the 30 subatomic particles known, or believed, to exist. About one-half of the research load of the ZGS is expected to be carried on by the Argonne Accelerator Users' Group, a cooperative organization of Midwestern physicists and universities headed by acting chairman E. L. Goldwasser of the University of Illinois.

Round-the-clock operation of the Aspeco shale-oil process starts this week at Denver Research Institute (Denver, Colo.). DRI operates a 24-tons/day pilot plant for Oil Shale Corp. (Carson City, Nev.). It re-engineered the facility last year (*CW*, July 19, '58, p. 102) to increase its efficiency and ease of operation. The current test of the revamped facility is scheduled to run four months.

A thermoelectric generator powered by solar energy was unveiled last week by a team of Westinghouse and Boeing engineers.

Proposed for long-mission satellites and space vehicles, the unit requires a large mirrorlike device—similar to a solar furnace—to collect and concentrate the sun's energy. A 3-lb., 20-in.-long bench model of the new generator develops sufficient power (about 2.5 watts) to operate a radio transmitter.

Three of the most potent synthetic hormones yet discovered have been reported by The Upjohn Co. (Kalamazoo, Mich.). Corticosteroids (like cortisone and hydrocortisone), the new drugs are expected to be valuable in treating skin and allergic diseases, rheumatoid arthritis and blood disorders. Chemically, they are 6 α -fluoro-16 α -methyl hydrocortisone acetate (U-11,893); 6 α -fluoro-16 α -methyl prednisolone acetate (U-14,766); and 6 α -fluoro-16 α -methyl-9- α -fluoro prednisolone acetate (U-18,404). U-18,404 is about 700 times as active as hydrocortisone in lab tests.

Shell Chemical is moving ahead with its plans for polyisoprene. Though the company hasn't revealed its marketing plans or a target date for the completion of a commercial plant, it admits that a 20,000-tons/year facility is now under construction at Torrance, Calif. (C. F. Braun is believed to be handling the engineering and construction). The catalyst employed in the process will likely be n-butyl lithium, which is now being made by Foote Mineral and by Lithium Corp. of America.

A single-dose oral polio vaccine immunizes infants, according to data from early tests. The vaccine was developed by American Cyan-

Technology

Newsletter

(Continued)

amid's Lederle Laboratories division. Previous oral vaccines required three separate doses to immunize.

Gases at ultrahigh temperatures and pressures as solvents? These supercritical gases are being researched at Germany's Goettingen University to see if they can be used as solvents to promote chemical reactions. Goettingen's Ernst Ulrich Franck, working with steam up to 750 C and 2,000 atm., has found that the ions of dissolved materials move at 10 times the speed they display in water at normal temperature. Observers believe Franck's research has industrial possibilities.

A pilot plant for making road-binder material from bituminous coal will be built by Curtiss-Wright Corp. at a Kentucky site. The binder, which is still in experimental stage, is made by digesting lumps of bituminous coal in coal tar at high temperature. Tests show it may be superior to asphalt, according to Minard Stout, Curtiss-Wright vice-president.

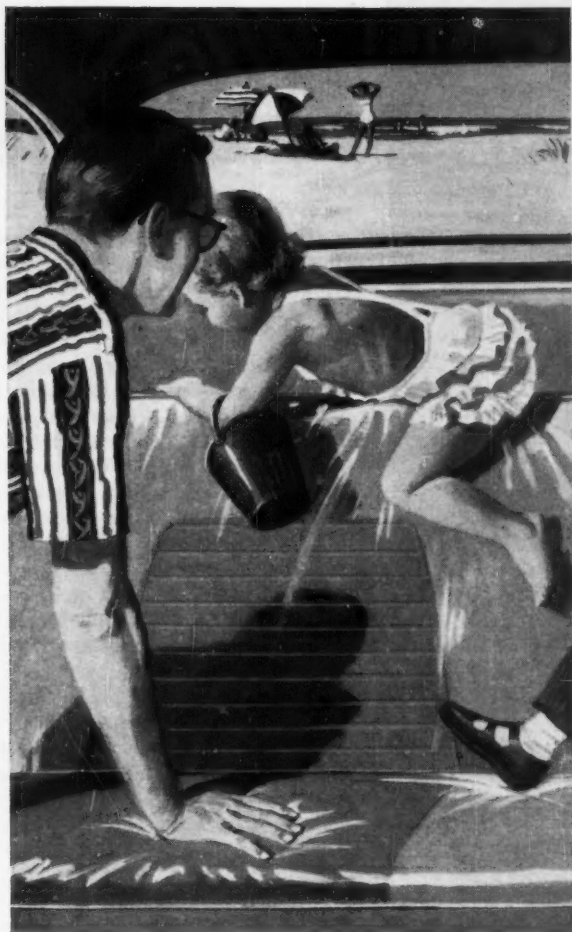
Kentucky's state highway department, which signed a \$200,000 contract for the research program, will build 8 to 12 half-mile experimental sections. The pilot plant will have a capacity of 3,000 gal./day of binder.

Forgeable tungsten is now being made by a new vacuum sintering technique developed by Firth Sterling Inc. (Pittsburgh). Key: powder metallurgy processing that yields tungsten metal of 99.9% purity, with densities exceeding 90% of theoretical. Unlike conventional forms of this highly refractory metal (it melts at 6170 F) and its alloys (which are virtually impossible to fabricate), the vacuum-sintered forms can be forged at 3400-3500 F; and they can be shaped to relatively close tolerances, thereby minimizing finishing operations.

An oil-from-coal synthesis plant will likely become a key part of India's third five-year plan for oil development. A 100-gal./day pilot plant, now being built at the Indian Institute of Technology (Kharagpur, West Bengal), is the first step toward a 250,000-350,000-tons/year plant that's expected to absorb part of the \$1-billion investment now contemplated for 1961-66.

The catalytic synthesis section of the plant will be supplied by Ruhrchemie AG-Lurgi. Gas produced by the gasification of coal in an existing 8,000-cu.ft./day water-gas plant will be processed at 600 psi, 300 C. Refined products will include diesel oil, gasoline, low-boiling hydrocarbons and other organic chemicals.

A patent (2,890,590) covering foamed metal and a method of making it, using metal hydride as a foaming agent, has been withdrawn. Assignment of the patent to Bjorksten Laboratories (Madison, Wis.) had revived aspirations that foamed aluminum could replace wood in some construction applications (*CW Technology Newsletter*, July 13, '57).



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Depression—

Target for

Three new drugs to combat emotional depression are moving toward prescription shelves this week. Vanguard of a new approach in "mental" therapy, they are designed to stimulate mind and mood, reducing the need for electric and insulin-shock treatments. Unlike tranquilizers, the new drugs bring patients "up" to normal instead of toning "down" anxieties. But drug men believe the newcomers have a similarly bright commercial potential.

Depression accounts for about 3 million visits to doctors each year. In its milder forms, irritability, insomnia or loss of appetite accompany depression.

In some extreme cases, suicidal tendencies occur. Considering the ubiquitous nature of depression, suitable drugs to combat it are considered capable of rivaling the over-\$200-million/year market achieved by tranquilizers since their relatively recent introduction.

All three newcomers have recently received Food & Drug Administration approval for use. They are Tofranil, a dibenzazepine derivative; 5(3-dimethylaminopropyl)-10, 11-dihydro-5H-dibenz (b,f) azepine hydrochloride, offered by Geigy Pharmaceuticals Division of Geigy Chemical Corp. (Ardsley, N.Y.); Nardil (β -phenylethylhydrazine) developed at the Warner-Lambert Research Institute (Morris Plains, N.J.); and Chas. Pfizer & Co., Inc.'s (New York) Niamid, chemically N-isonicotinoyl-N'-(S- β [N-benzylcarboxamide]-ethyl) hydrazine.

How They Work: Geigy calls Tofranil a thymoleptic—antidepressants are generally known as psychic energizers—and says its mechanism of action in relieving depression is not understood. However, it is not a monoamine oxidase inhibitor, as are Nardil and Niamid.

Monoamine oxidases are a series of enzymes that break down hormones such as epinephrine (adrenalin), nore-

Depression victims find new relief in drugs that save essential hormones.



the Newest 'Mental' Drugs

pinephrine and serotonin, which are associated with normal functioning of the brain. Niamid and Nardil are monoamine oxidase inhibitors, cause an increase in concentration of these hormones in the brain stem. The desired psychiatric response occurs in one to six weeks.

Insight into this mode of action dates back to clinical experience with the first known psychic energizer, Hoffmann-La Roche's (Nutley, N.J.) Marsilid (iproniazid), chemically 1-isonicotinyl-2-isopropyl hydrazine phosphate.

Originally introduced for the treatment of tuberculosis, this drug was found to have the side effect of stimulating the central nervous system, a trait traced to its ability to inhibit monoamine oxidase. Its clinical use was extended to improving the mood among "long-term psychotics of the burned-out kind" (*CW Technology Newsletter*, April 13, '57).

Shortly after the introduction of Marsilid, it became apparent that dosage was very important in preventing serious, even fatal, reactions. These difficulties have been almost entirely resolved and about 500,000 patients have been treated with the drug.

So far, Marsilid is the only monoamine oxidase inhibitor generally available. Hoffmann-La Roche has continued to research new hydrazine varieties both in the U.S. and at its Basle, Switzerland, laboratories. A large number of compounds have been prepared and tested, and active compounds have been turned up among the N_1, N_2 -dialkylhydrazides. Optimum activity with 3- to 4-carbon alkyl chains has been observed.

Roche reportedly has three other iproniazid (Marsilid) analogs under investigation: DL-acetyl-methionyl- N_2 -isopropylhydrazide (Ro 4-1018); N' -(*p*-chloro-benzoyl)- N_2 -isopropylhydrazide (Ro 2-6797) and L-alanine-isopropyl hydrazide (Ro 5-0700). All the compounds the firm is testing clinically are hydrazides. Their activity in inhibiting monoamine oxidase varies.

Nardil and Niamid are outgrowths

of this early experience with Marsilid. Nardil appears to have about the same order of effectiveness, Nialamid is claimed to be 10 times as potent, less toxic.

Catron, β phenyl-isopropyl hydrazine (JB-216), developed by Lakeside Laboratories Inc., (Milwaukee, Wis.), is also being widely studied. It appears to be more powerful than Marsilid as an oxidase inhibitor.

Lakeside has also come up with a compound that is useful primarily for studying other drugs' action on the mind but has also been used beneficially in a few cases of depression. Called Ditrin, it is N-methyl-3-piperidyl benzilate (JB-329). In oral doses of 5-10 mg., it causes auditory and visual hallucinations.

Lakeside has prepared several hundred hydrazine derivatives—in the course of which its two new compounds were discovered—and has run animal tests at its own laboratories and with the help of the University of Washington and the National Heart Institute.

Work on psychic energizers is also going on in the laboratories of Eli Lilly, Schering, Squibb, Abbott, and Smith Kline & French. Results have been kept pretty much under wraps, although Smith Kline & French has reported the only nonhydrazine type of monoamine oxidase inhibitor.

In rabbits, the SKF compound—2-phenyl cyclopropyl amine (SKF-Trans-385)—appears to be about 100 times more active than Marsilid. Abbott is known to have tested more than 50 hydrazine derivatives but has not disclosed results.

Choice of Weapons: Not all psychic energizers depend on monoamine oxidase inhibition for their effect—as Geigy's Tofranil demonstrates. Geigy calls this compound "unique chemically, unique pharmacologically."

While the term antidepressant has been used to describe a heterogeneous group of drugs, most of which are central nervous stimulants, says Geigy, Tofranil is different in that it does not act as a central nervous system stimulant in the absence of depression. To describe its compound, Geigy has pro-

posed the term thymoleptic from the Greek roots thymos (mood, spirit) and leptos (to change, to influence).

There are, however, a number of central nervous system stimulants that are proving valuable in mental therapy. Like Tofranil, they do not inhibit monoamine oxidase. Among these are Ciba's Ritalin, methyl α -phenyl-2-piperidineacetate hydrochloride; Merrell's Meratran (α, α' -diphenyl-2-piperidinemethanol) and Riker's Deaner (2-dimethylaminoethanol *p*-acetamidobenzoate).

Ciba, for example, describes Ritalin as a "mild cortical stimulant that counteracts oversedation, lassitude, depression and certain other side effects of barbiturates, antihistamines, chlorpromazine and *Rauwolfia* derivatives. It arouses the apathetic, moody, tired, depressed or mentally retarded person to increased mental and physical activity." It "increases mental alertness of withdrawn psychotics."

Safety First: A major objective of research on antidepressants, or psychic energizers, has been to find compounds that are free of troublesome side effects. Possible side reactions in this class of drugs are liver toxicity, postural hypotension (a patient arising from a prone position experiences a sharp drop in blood pressure). However, the new drugs have largely overcome these drawbacks.

Pfizer says no liver damage has been experienced with Niamid in clinical trials, to date. And postural hypotension is rarely seen.

Warner-Chilcott Laboratories (Morris Plains, N.J.), supplier of Nardil, states that "clinical investigators have used Nardil without any evidence of liver or other serious toxicity. The drug is given in low doses and has a large therapeutic margin of safety; the occasional side effects reported have been transient and quite readily managed with adjunctive therapy."

Despite progress, clinicians warn against calling the newcomers "wonder drugs." They do not eliminate the need for psychiatric help, but there's no discounting their therapeutic value and their rapidly increasing commercial importance.

At Diamond Alkali Company



MODERN BRINE TREATMENT PLANT

handles large capacity with Dorr Clarifiers



Two Dorr Clarifiers in operation. Units are equipped with radial beams and a submerged peripheral launder system.

The recently modernized brine treatment plant of the Diamond Alkali Company, at Painesville, Ohio, is one of the largest of its kind in the world. Its design is the result of a coordinated research project carried out by Diamond Alkali's Research Center and Dorr-Oliver's Testing Laboratories at Westport, Conn.

Raw brine from underground wells is stored in a service reservoir, then given pre-treatment with chemicals in Dorr paddle agitators before passing to two 70' dia. Dorr Clarifiers. The thickened underflow is withdrawn by Dorrco Diaphragm Pumps.

This installation is another example of the adaptability of Dorr-Oliver designs to meet highly specialized requirements. There is a type of Dorr Thickener or Clarifier for virtually every sedimentation or clarification problem in chemical, metallurgical and industrial processing. The long experience of Dorr-Oliver engineers is always at your service to suggest the most effective design and to work out any modifications that may be necessary. Just drop a line to Dorr-Oliver Incorporated, Stamford, Connecticut — or better still, have one of our engineers call and discuss your particular application.

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RESEARCH

Trimming the Language

This week, the results of a study of two systems designed to identify chemicals more briefly and with less ambiguity than by conventional methods are being examined by a National Research Council committee. The committee's decision could be of special importance to laboratories that use data-processing machines for literature searches and similar projects.

For more than a decade, better notation systems (using letters, numbers, symbols) have been sought as a way to reduce the labor involved in listing organic chemicals in reports and publications, to save space, and to make clear distinctions between certain complex compounds. A better system represents a sizable potential saving in manpower and materials to lab-



CW PHOTO—LIONEL CRAWFORD

NRC's MacLennan: Time for decision.

oratories and technical journals.

Out of this work, two systems have survived. One is the work of G. Malcolm Dyson, newly appointed research director of *Chemical Abstracts*. The other is that of William Wiswesser, industrial hygienist of Willson Products Division, Ray-O-Vac Co. (Reading, Pa.), which is a division of the Electric Storage Battery Co. Dyson's method has this edge: it was adopted as the provisional international cipher in 1951 by the International Union of Pure and Applied Chemistry (IUPAC). But Wiswesser's method is shorter, and some authorities consider it at least as good.

To resolve which is better, the National Science Foundation has spon-

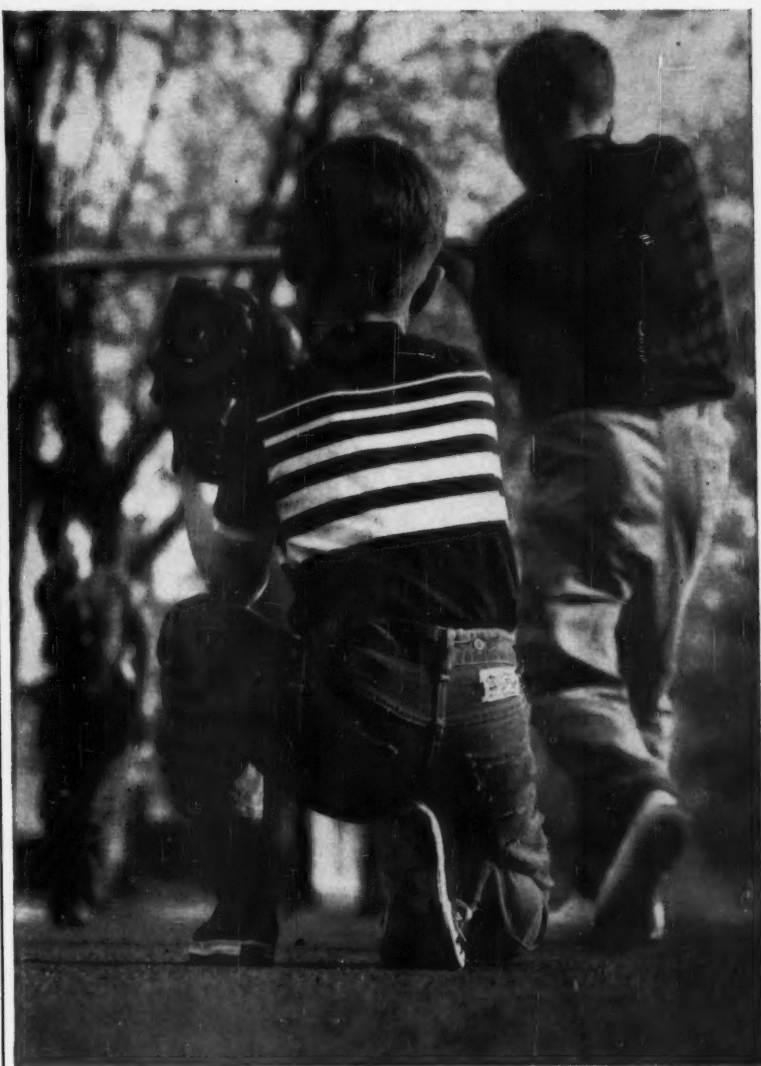


Wiswesser: His system is shorter.

sored an evaluation of the two systems by a group headed by James Perry, director of the documentation center at Western Reserve University's (Cleveland) school of library science. Perry's group has coded 3,000 compounds by each of the two methods, and has evaluated them on the basis of (1) speed of ciphering; (2) how long it takes to reach the maximum ciphering rate; (3) frequency of errors in coding; (4) subjective impressions by staffers working with both systems.

The nine-member NRC committee, headed by American Cyanamid staff assistant John MacLennan, is examining Perry's results. It will convey its findings through channels to IUPAC's commission on codification, which meets in Munich, Germany, late in August. IUPAC is expected to decide on a permanent notation system at that time. If it does—although a small body of American chemists feel neither system is ready for permanent adoption—the NRC appraisal will doubtless count appreciably in the decision.

General use of a notation system to replace current cumbersome chemical descriptions won't necessarily eliminate what MacLennan and colleagues call "trivial" names such as "insulin" or "olive green." These names are much shorter than their coded names can possibly be with either the Wiswesser or Dyson system. Such names are valuable where the chemical structure is known but are useless in the absence of such knowledge. "Trivial" chemical names serve as a convenient tag, aren't technically descriptive.



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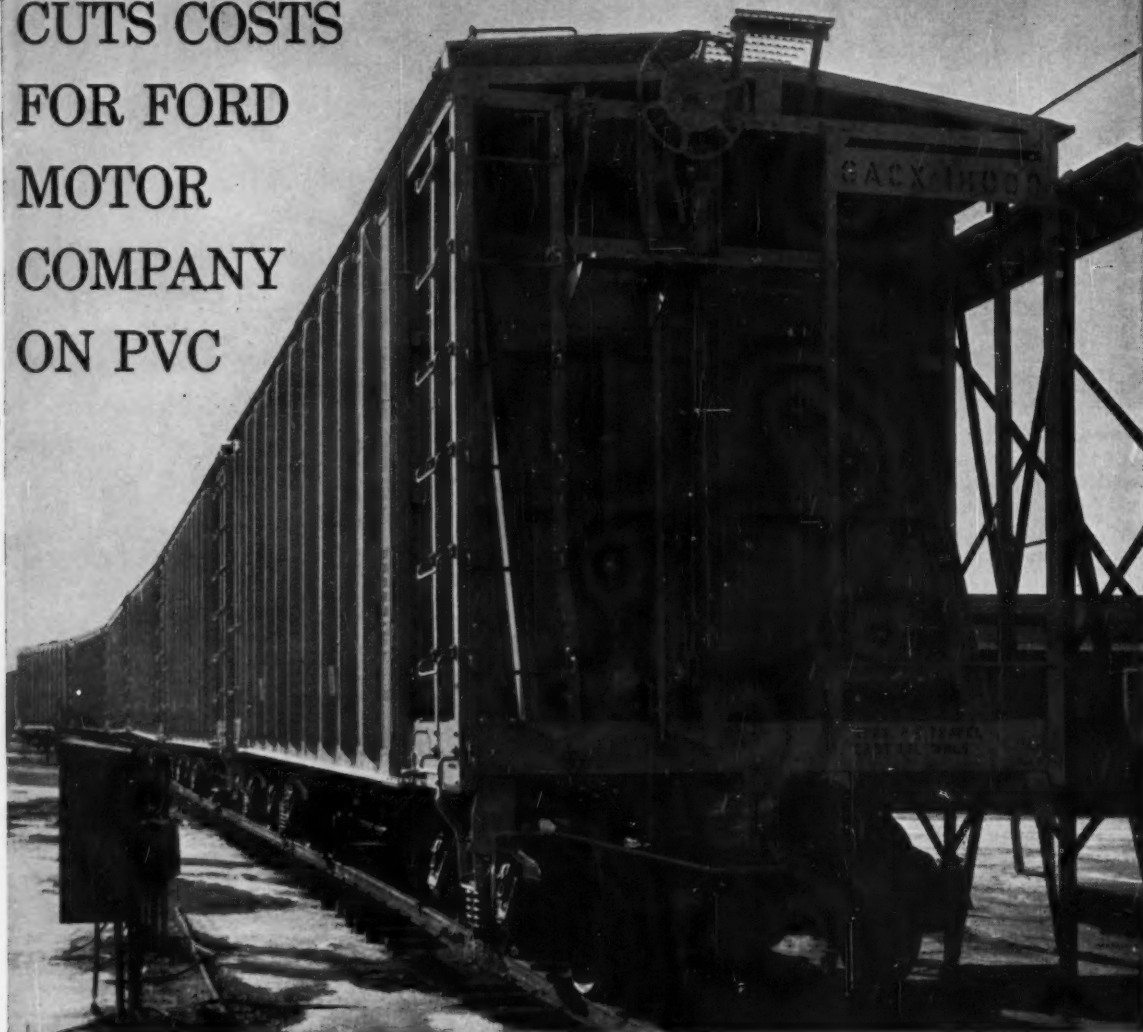
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ENGINEERING

Columbium-Tantalum Processing Lineup

| Company | Location | Startup | Products | Capacity (pounds/year) | Process |
|----------------------|----------------------------------|--------------|--|---|--|
| FANSTEEL | North Chicago Muskogee, Okla. | 1921 1958 | Powder, melting electrodes, ingot, foil, sheet, rod, wire and tubing | Ta: over 200,000 Nb: over 60,000 (both plants) | Solvent extraction |
| WAH CHANG | Albany, Ore. | 1957 | Powder, sintered bar, ingot, roundels | 120,000 (both metals) | Solvent extraction |
| UNION CARBIDE METALS | Niagara Falls | 1957 | Dendrites, roundels, electrodes, ingot, alloys | "prototype plant" (est. total: 50,000-100,000) | Solvent extraction |
| KAWECKI | Boyetown, Pa. | 1957 | Powder, ingot, sintered bar, plate, sheet, foil, rod, wire, electrodes | "Big" (mostly tan- talum; est. total: 50,000-100,000) | Fractional crystallization |
| KENNAMETAL | Lafrobe, Pa. | 1956 | Powder, electrodes, sheet, wire | Varies with market (est. total: 50,000-100,000) | Proprietary ("different from other producers") |
| NATIONAL RESEARCH | Cambridge, Mass. | 1958 | Tantalum only, as powder, ingot, sheet, rod, wire, tubing | 30,000 | Proprietary ("different from other producers") |
| USI CHEMICALS | Cincinnati | 1957 | Pilot production of sponge made into ingot, billet, bar, sheet, wire, rod by Mallory-Sharon | Ta: 12,000 Nb: 12,000 | Sodium reduction |
| DU PONT | Wilmington and Newport, Del. | 1957 | Columbium only, as ingot, some mill forms, alloys | Experimental quantities | Not available |
| VAR-LAC-OLD | Elizabeth, N.J. | 1945 | Powders and salts | Research quantities (under 500) | Solvent extraction |
| STAUFFER | Richmond, Calif. | 1959 | Pentachlorides | Semiworks quantities | Distillation of chlorides |
| MINERALS REFINING | North Salt Lake City | 1959 | Metals | Not available | Solvent extraction |
| MALLINCKRODT | St. Louis | 1956 | Concentrates; small amount of tantalum product; investigating production of columbium and tantalum products | Ta: small Nb: none Considering commer- cial production | Selective precipitation |

New Push for Columbium and Tantalum

The growing field of columbium and tantalum processors (above) provides news on several fronts this week as the country's largest columbium producer, Wah Chang Corp., took the wraps off its 1½-year-old plant at Albany, Ore., gave CW a look inside.

Other news from columbium-tantalum processors this week: Stauffer

Chemical Co. is starting the final shakedown of its \$300,000 semiworks plant at Richmond, Calif., for production of purified pentachlorides of the two metals; National Research Corp. (Cambridge, Mass.) says it will soon have an 8-in. arc-melted ingot of its high-purity tantalum, has quoted on diameters up to 12 in.; and Min-

erals Refining Co. says that it will start producing the metals at North Salt Lake City later this year.

Recurring theme from all producers of columbium and tantalum: the importance of high purity in making the metals more easily fabricated, expanding their markets, and the importance of chemical processing in carrying

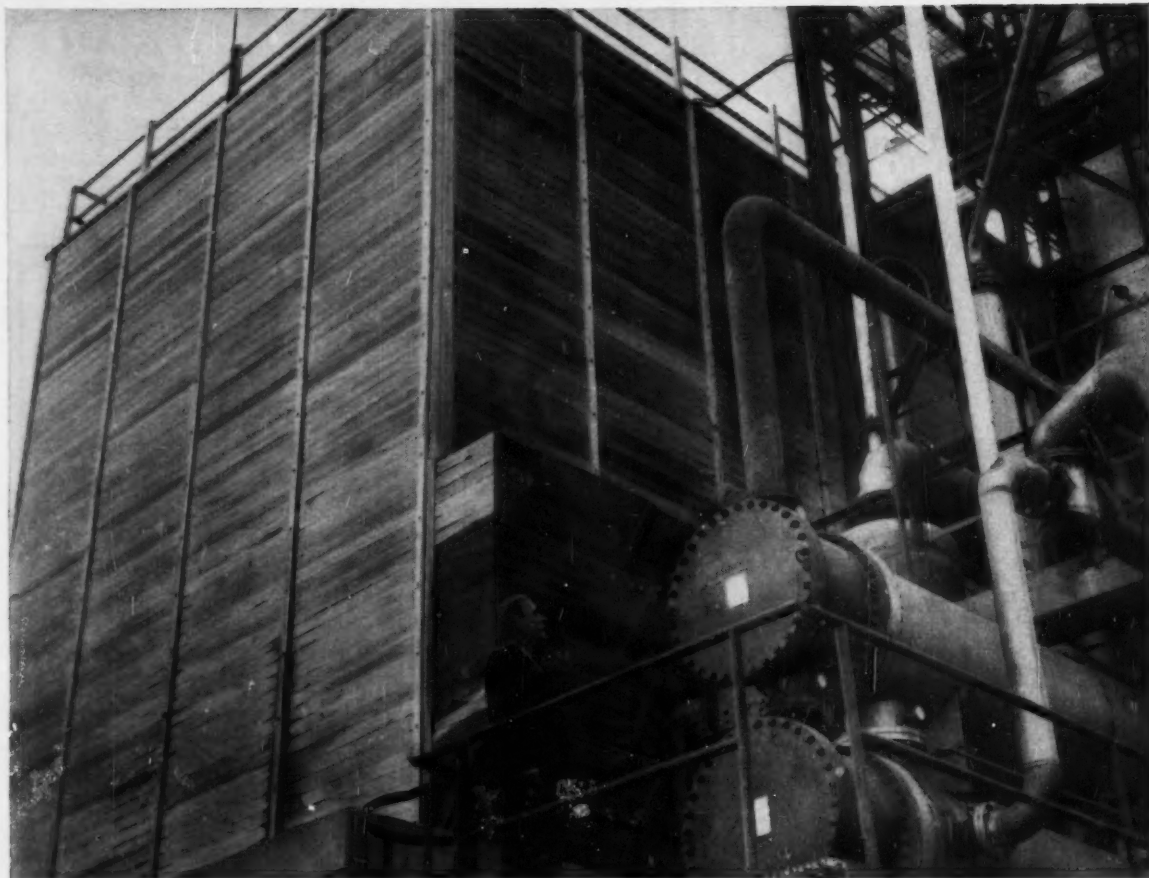


Photo and information, courtesy of Chemical Processing Magazine

Going two years! Nickel Stainless Steel doubles life of nitrogen oxide exchangers

...has already saved thousands with more savings to come

Until recently, corrosion of heat exchangers at the Cooperative Farm Chemicals Association plant in Lawrence, Kansas was an acute problem. Sometimes the exchangers, used to cool nitrogen oxides, had to be completely replaced within a year . . . at a cost of thousands of dollars.

Now comes word that nickel-containing Type 304 stainless steel exchangers . . . the ones shown above . . . have lasted two years. And they are expected to be on-the-job for some time to come. The units were made by Western Supply Company of Tulsa, Oklahoma.

Temperature is reduced 410° F


As a step in the production of 57% nitric acid, the units take nitrogen oxides derived from ammonia oxidation and cool them from 500° F to 90° F. Each exchanger has 1305 square feet of cooling surface. Surface is obtained with 473, ¾-inch tubes. Tubes are Type 304L stainless steel. With the exception of channel side and external bolting, shells are also Type 304.

Other savings

In addition to eliminating early replacement cost, the use of nickel-

containing stainless steel in these exchangers is materially reducing general maintenance and down time.

In thousands of other chemical processing applications, nickel-containing stainless steels are doing as much or more. Contact your fabricators about these useful steels. Or go to the producers of stainless steel for information. Ask them to suggest places where a stainless steel specification can save money in your plant.

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Market Newsletter

CHEMICAL WEEK

July 4, 1959

A seasonally adjusted price schedule on potash for the '59-'60 fertilizer season was posted last week by American Potash. These prices apply on contracts signed before July 1, '59 (per unit of K_2O , bulk, f.o.b. cars, Trona, Calif.): "improved" muriate of potash, July-August, 38¢/unit; September-October, 39¢; November-December, 40¢; January-May '60, 42.5¢; June '60, 38¢.

Tabs on granular muriate are 1¢ higher per unit of K_2O . An additional 2¢/unit will be added to these prices on contracts signed after June 30.

There's considerable pricing flexibility in AP&C's contract terms. For example, AP&C reserves the right to adjust these potash quotes to "meet competition of domestic producers located at Carlsbad, N.M."

Moreover, the buyer is assured of two potential price breaks: future "general" price reductions will apply retroactively to all tonnage in buyer's possession that was purchased for shipment during the price period for which the general reduction is made; a buyer who submits "satisfactory evidence" that he can buy, at lower price, comparable muriate of potash from another U.S. producer (under similar contract terms) will either get the same reduced price from AP&C or will be allowed to cancel the specified tonnage from his AP&C contract.

•
Political-economic turmoil in Cuba since Fidel Castro's revolution (*CW*, Jan. 10, p. 21)—and now reportedly coming to a boil—is of considerable concern to many U.S. chemical marketers. A special report on Cuba by the U.S. Business & Defense Services Administration now underscores the interrelationship of Cuba's chemical business with the U.S. chemical process industries. Here are some highlights:

Most of Cuba's chemical requirements are supplied by imports, of which 80-85% originate in the U.S. Value of major categories shipped from the U.S. in '56: industrial chemicals, \$5 million; specialties, a near-\$12.5 million; pigments, paints, varnishes, \$4.3 million; fertilizers, \$6.2 million; explosives, etc., \$798,793.

From \$60-70 million worth of pharmaceuticals are sold annually in Cuba. Domestic production accounts for about \$32 million worth (\$10 million by Cuban-owned labs, \$22 million by foreign-owned—mainly U.S.—plants).

An estimated 1.25-1.3 million lbs. of polystyrene are imported; almost all is U.S. produced.

•
Prices of five fluoroalcohols have been reduced to \$10/lb.—from development prices that ranged \$30-40/lb. The compounds, made by

Market Newsletter

(Continued)

Du Pont, are identified as C₃, C₅, C₇, C₉, C₁₁ fluoroalcohols, contain 57.5-71.4% fluorine. Uses: intermediates in manufacture of plastics, lubes, corrosion-resistant coatings, etc. C₃ and C₅ fluoroalcohol blends are available at \$7.50/lb. for 1:1 mixtures, and \$8.50/lb for 1:2 mixtures.

Price of high-purity L-glutamine is reduced to \$75/kilo, in 500-kilo lots, by General Mills. Substantially lower prices will apply to commercial volumes. The chemical, used in nutrient media in manufacture of Salk vaccine, has been listed at \$150/kilo in small quantities; synthetic D,L-glutamine is currently being marketed at a price of \$100/kilo, based on L-content.

A pickup in automobile sales spells good news for suppliers of the myriad chemical products used by auto makers. At the beginning of the year, sales were running at the rate of 5.3 million units/year. Retail sales of both domestic and foreign autos are now proceeding at a rate of 6.3 million units/year. Domestic cars are selling at the rate of 5.8 million/year.

Based on auto production for the first four months of '59—average monthly production: 6 million units—it appears likely that the year will see 5.9 million units produced.

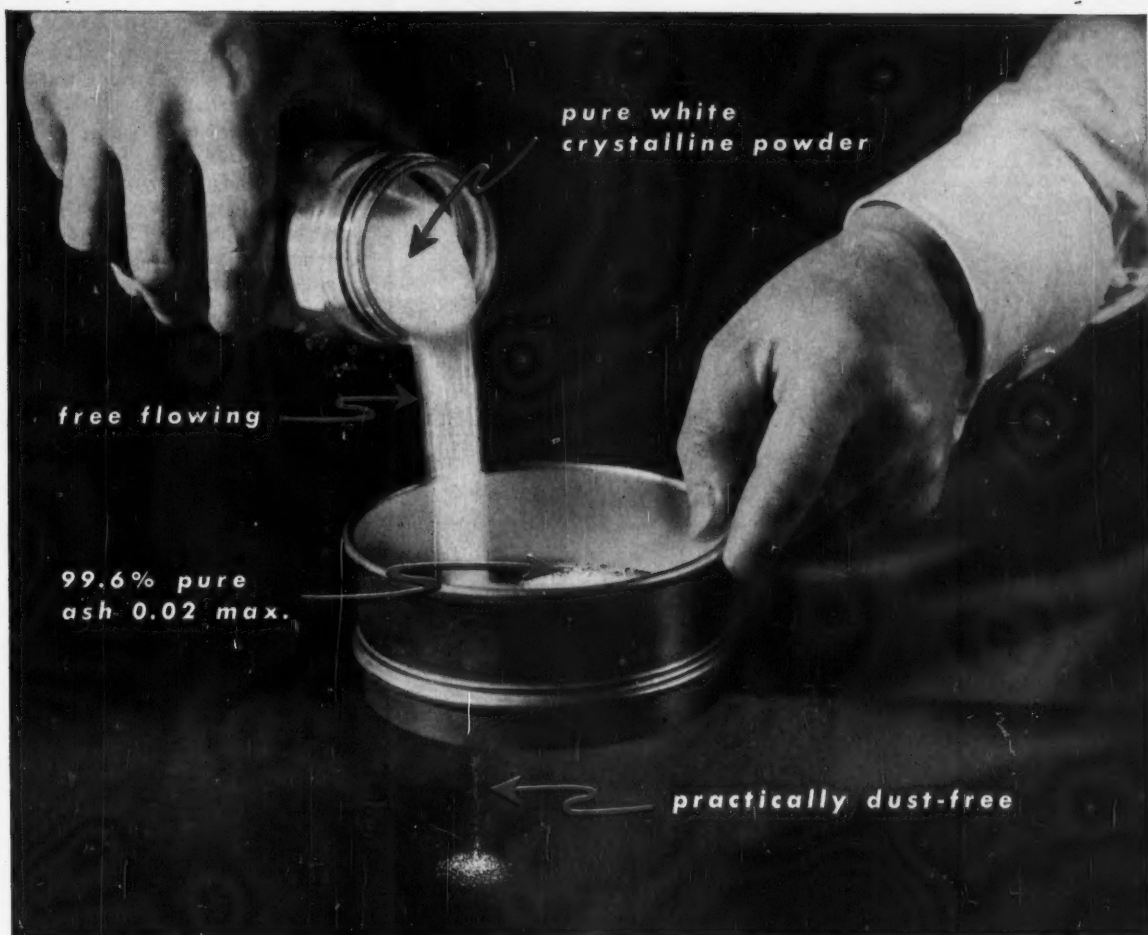
"The year '60," says Lionel D. Edie & Co., which has made a study of the current auto-market situation, "is expected to register a gain over this year."

"Gypsy" reselling of alkalis took a knockout count this week. Major producers have eliminated freight equalization payments on materials picked up by the customer in his own trucks at the supplier's plant. Resellers have often abused the privilege by seeking distant plants (to maximize the allowance) and reselling the chemicals at cut-rate prices en route home or in the home market (*see p. 63*). Chlorinated solvent makers stopped freight equalization allowances on pickups last summer; earlier this year, sodium phosphate producers did the same thing.

SELECTED PRICE CHANGES—WEEK ENDING JUNE 29, 1959

| | Change | New Price |
|--|---------|-----------|
| UP | | |
| Lemon oil, U.S.P., Calif., cns., dms. | \$0.40 | \$3.10 |
| Platinum, metal, works, oz. | 1.00 | 76.00 |
| DOWN | | |
| Copra, Atl., Gulf ports, c.i.f., ton | \$12.50 | \$242.50 |
| 26 Di-tert-butyl-paracresol, food grade, dms., Lt.L., dlvd ... | 0.42 | 0.68 |
| Mercury, metal, 76 lbs./flask, net flask | 1.00 | 239.00 |

All prices per pound unless quantity is quoted.



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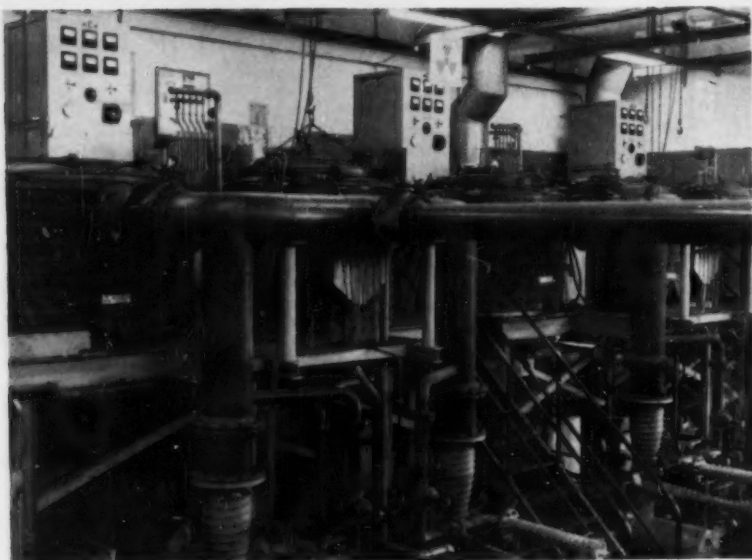
Maleic Anhydride • Fumaric Acid • Phthalic Anhydride • Adipic Acid
Succinic Anhydride • NADONE[®] Cyclohexanone • NAXOL[®] Cyclohexanol
Tetrahydrophthalic Anhydride • Hexahydrophthalic Anhydride • Dodecenylsuccinic
Anhydride • NADIC[®] Anhydride • NADIC[®] Methyl Anhydride • Succinic Acid



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Row of big reduction furnaces point up size of . . .



U.S.'s Biggest Columbium Producer

Wah Chang is the biggest columbium producer in the country, has the largest columbium ingot ever melted: 12 in. in diameter. Columbium is reduced at Wah Chang's big Albany, Ore., plant in the large vacuum induction furnaces shown in the top picture. Carbon and the metal oxide are reacted to produce the carbide, which is mixed with more oxide, charged to these furnaces for reduction to metallic pellets. The oxides are prepared from the fluorides produced by the liquid-liquid solvent extraction separation plant (lower picture). The methyl isobutyl ketone extraction procedure worked out by the U.S. Bureau of Mines is the basis for the removal of columbium and tantalum from the ore concentrate, subsequent separation from each other. Last year, sales of all types of columbium metal by all producers totaled about 30 tons.

(Continued from page 51)

out the purification. Present routes, for the most part, are variations centering on solvent extraction (CW, Aug. 31, '57, p. 82), followed by carbon or electrolytic reduction, but even newer routes are being studied. Examples: distillation of the chlorides, sodium reduction.

Inside the Plant: The route used by Wah Chang is the now-conventional solvent extraction process developed by the U.S. Bureau of Mines using methyl isobutyl ketone (MIBK). Since the company aims a large part of its 120,000-lbs./year capacity toward the production of columbium (enough to make it '58's largest producer of this metal), a typical starting ore will run a columbium-to-tantalum ratio of about 4:1.

The finely divided ore is dissolved in 70% hydrofluoric acid. This is accomplished in polyethylene-lined wood tanks, where the slurry is agitated until a predetermined metal concentration is reached. Then, after the solids settle, the clear solution is pumped to tanks for dilution.

The extraction with MIBK takes place in open polyethylene columns, serves two purposes. In the first (highly acidic) extraction, both columbium and tantalum values are dissolved in the organic phase; essentially all impurities from the ore are discarded with the strong acid solution. Then, in a less acidic medium, demineralized water strips out the columbium salt; finally, in even more dilute solution, the tantalum fluoride is removed from the organic layer. The aqueous raffinate, containing the separated metal salts, are pumped to storage tanks.

Reduction to the metals occurs after conversion of the fluoride salts into oxides. A mixture of carbon and the respective oxide is charged in graphite crucibles to high-frequency furnaces, where the carbide is formed. Then, stoichiometric amounts of the carbide and oxide are mixed, pelletized and charged to a vacuum induction furnace, where the reduction takes place. Product of this furnace is in the form of small pellets.

The metal pellets are then converted into the hydride, crushed to powder and dehydrided. The powder is compacted to bars of various dimensions, charged to vacuum sintering furnaces, which produce bars suitable for processing to foil, sheet, tubing, other shapes, and for melting

in an arc or electron-beam furnace. Wah Chang already has a Stauffer-Temescal electron-beam unit as part of its production facilities, is weighing the addition of an NRC Equipment Corp. double-vacuum electron-beam unit (*CW*, March 7, p. 39).

What Others Do: Most other processors have also taken up the solvent extraction route in the past few years. Exception: Kawecki Chemical Co. is studying it, but sticking to the older fractional crystallization method at its Boyertown, Pa., plant. Crystallization was also used by Fansteel Metallurgical Corp. at its North Chicago plant and to some extent at its new plant in Muskogee, Okla. Solvent extraction has since proved itself, entirely replaced crystallization at Fansteel.

Other users of solvent extraction include Union Carbide Metals Co., at its Niagara Falls plant, and Var-Lac-Oid Chemical Co., producer of research amounts of the purified metals and their salts at Elizabeth, N.J. Minerals Refining's affiliate, Alpha Mining and Milling Corp., has been producing small quantities of the oxides separated by solvent extraction since '57, will start carrying out the reduction step in Aug. '59.

Kennametal Inc. (Latrobe, Pa.) and National Research Corp. (Cambridge, Mass.) won't talk about their processes. Since Kennametal is a producer of carbide tools, it's likely that tantalum and columbium are obtained as by-products in the making of tantalum carbide. NRC's chemical separation to obtain highly purified tantalum is under wraps until patents are obtained.

Du Pont's operations at the Wilmington, Del., experimental station and at its Newport, Del., facilities include processing of ore into columbium and experimental alloys by an unannounced process.

New Approaches: Stauffer's facility at Richmond will be a near-commercial tryout of a method being researched by many: separation of the chlorides. Present state of the art is to chlorinate the ferroalloy, separate the chlorides by distillation. Among the other variations being studied by industry and by the Bureau of Mines: complexing the chlorides.

Reduction by sodium or magnesium is also receiving close attention. These reagents, though more costly than carbon, can be used on a much

larger scale, do not require the careful proportioning that carbon demands. One advocate of sodium reduction, U.S. Industrial Chemicals Co., is piloting that method at Cincinnati. USI supplies tantalum and columbium sponge to Mallory-Sharon Metals Corp. for fabrication and sale to selected customers. In the event of commercialization, Mallory-Sharon would undoubtedly take over the project, handle the processing from start to finish.

And two patents (U.S. 2,859,098-9) assigned to nonproducer Mallinckrodt Chemical Works describe another separation method. It's based on the selective precipitation of tantalum oxide from an acidic mixture of columbium and tantalum fluorocomplexes upon addition of hydrated columbium oxide. Mallinckrodt has been processing euxenite ore for Porter Bros. Corp. (Bear Valley, Idaho) since '56, returning a concentrated oxide mixture to Porter Bros. But, according to a recent "red herring" prospectus on an impending debenture sale, Mallinckrodt has been supplying one customer with small amounts of a tantalum product, is investigating the prospects of large-scale production of columbium and tantalum products. Possible time of entry into the market: mid-'60.

Purity-Price Scramble: One of the big questions still remaining in the columbium-tantalum industry is standardization of purity grades and price schedules. The two metals still serve a small enough market that a big order gets special attention, special prices. In fact, uses are so specialized that customers must specify the exact purity they need.

Small amounts of interstitials (carbon, oxygen, nitrogen, hydrogen) in the metal may make it unusable for a given application. The lowest values are generally obtained after electron-beam melting, but NRC says that vacuum-arc melting of its high-purity melting-grade powder (250-ppm. oxygen) gives an ingot comparable in forgeability and performance to one formed by electron-beam melting of less pure stock. Of course, electron-beam melting of top-purity powder gives the best results.

One reason for the somewhat turbulent picture is the discovery in the past few years of just how important it is to reduce trace impurities, sub-

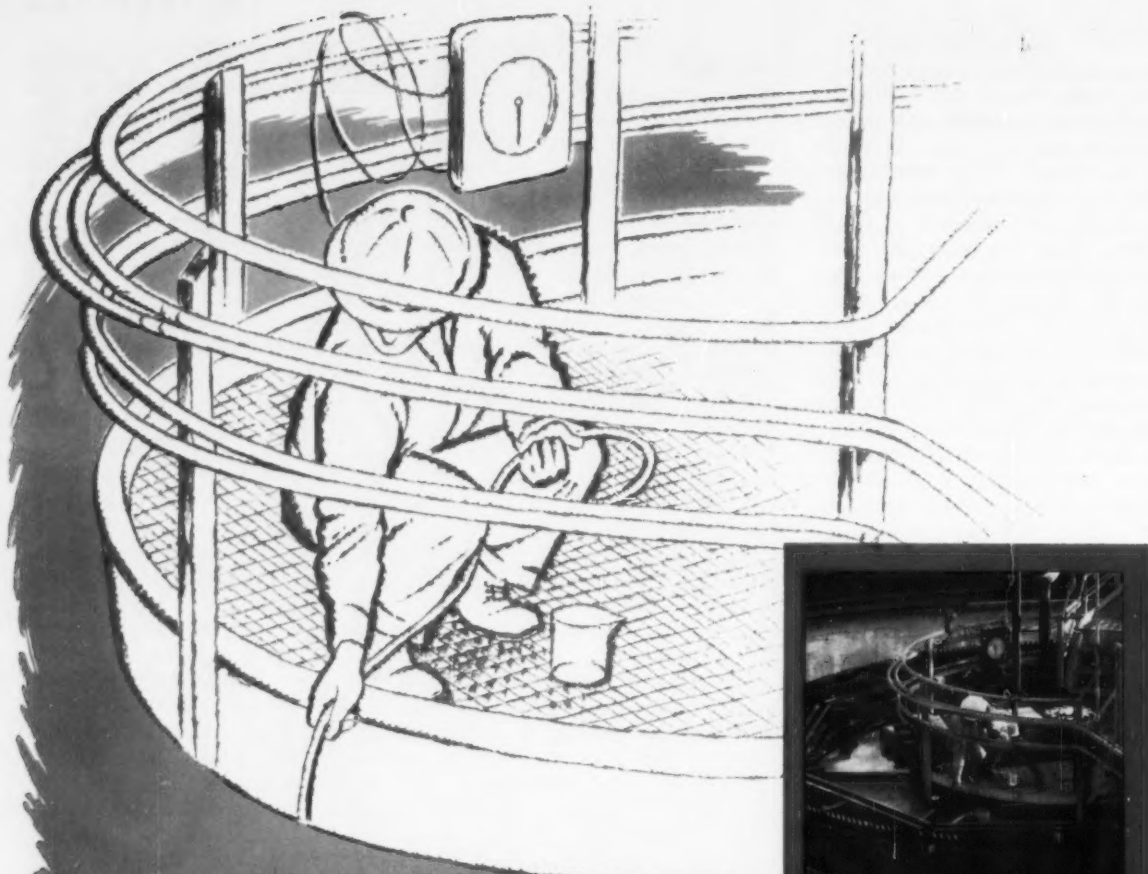
sequent development of purer grades. Metal grades as specified several years ago have little meaning now. For instance, the term "high purity" now has little significance, must be replaced with a list of impurity levels. And the phrase "capacitor-grade tantalum" is no longer synonymous with top-purity. Reason: particle size and shape are important in capacitor-making; a product can now be of higher purity than is required by capacitors and yet not have the required physical properties.

Because grades have not yet been standardized, prices are also highly dependent on the exact specifications and the size of the order. Carbide's recently publicized tantalum price cut to \$35/lb. (*CW Market Newsletter*, June 13) applies only to one grade, tantalum dendrites (a coarse melting stock with a maximum oxygen content of 800 ppm.). Tag on NRC's 250-ppm.-oxygen powder is \$43. Other producers name vague ranges for their products (e.g., "\$35-75 for powder, \$50-85 for ingot"), say "it all depends on how much we have to do and how much you want."

Unused Capacity: Most plants are still highly flexible in the amount and purity of products they can turn out. Processors have built with an eye to the day when columbium-base alloys are considered standard material of construction in air- and spacecraft. Thus, current production (30 tons of columbium, 100 tons of tantalum in '58) is well under 50% of present capacity. And, since there are several batch steps involved, most producers report that they can easily enlarge their facilities by 100% or more.

Imports are also a factor to be watched by the domestic industry. For instance, Shieldalloy Corp. (Newfield, N. J.) has sold substantial amounts of German-made material in this country, will soon be offering better grades than it has in the past.

But, until the structural alloys being developed by Du Pont, Carbide, General Electric and Pratt & Whitney are demanded in commercial quantities, columbium will have to continue to bank on its nuclear characteristics for use as a fuel-element alloying or cladding material. Tantalum's growth prospects are closely tied to the electronics industry, although its use in processing equipment is receiving close attention.

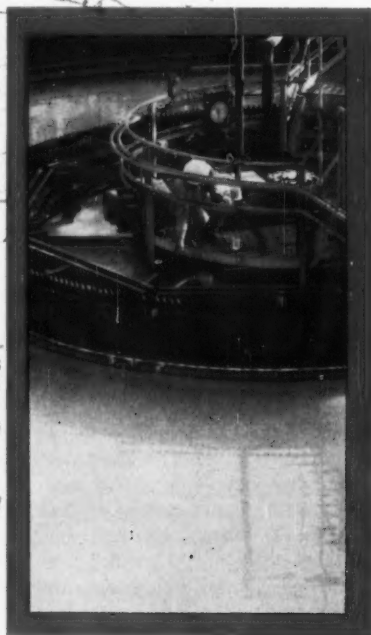


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SPECIALTIES

Locking Horns over Prescription Insurance

IN FAVOR

The rising cost of drugs makes prescription insurance inevitable. These plans, preferably run by groups of pharmacists, will permit the general public to obtain drugs now beyond their means. There'll be more paperwork for the pharmacists and increased costs but higher volumes of drugs will more than offset these. The public will pay more for drugs than they do now but they'll get the drugs that may keep them out of hospitals—thus cutting down on the most expensive family medical care item.

AGAINST

Prescription insurance plans are the thin edge of a socialistic wedge. They're a step down the road to government control of drug-making, pricing, and distribution. They're bound to be abused—e.g., to force discounts. The small independent pharmacist won't be able to keep up with the paperwork, will lose out to the big chains. Those people that couldn't get the expensive antibiotics and steroids before will pressure doctors into overprescribing them and the drug companies will encourage this.

Prescription Plans: Controversial Comers

Pharmaceutical makers are looking west—for the controversial prepaid prescription insurance plan will get a large-scale tryout in two California counties later this year. Such a plan could signal a change as dramatic to U.S. drug marketers as Blue Cross and Blue Shield have been to doctors and hospitals.

If successful in California's Fresno and Merced counties, the plan will be offered to anyone living in California who has health insurance with a recognized firm. Monthly cost to participants will come somewhere between \$4 and \$10 for a family of four, according to initial estimates.

Promoters of the West Coast project are not, of course, the first to offer prescription insurance; it's more than probable that organizers were encouraged by the success shown by earlier plans.

Probably most publicized of the prescription insurance plans now extant is the Prescription Services, Inc. plan that's been carried on in Windsor, Ontario, Canada, for the last 15 months. Since many features of the California plan seem patterned after the Canadian one, *CW* checked with W. A. Wilkinson, an Ontario druggist who is one of the principal forces behind P.S.I., found him optimistic

about the future of prescription insurance in general.

He told *CW* that a recent survey of members of P.S.I. shows beyond any doubt that drug insurance is workable, that it's administratively feasible, and that both participants and pharmacists like it very much. Also important: doctors approve it.

Wilkinson says the plan's major failing up to now was that it was being sold too cheaply; adult rates were about 50% of what they needed to be to enable the plan to break even. Cost of drugs and the high frequency of use found P.S.I. paying out twice what it was taking in. Consequently, an adjustment had to be made. Under the new rates, each adult policy holder will have to pay \$1.90 and there's a flat fee of 65¢ for each of the first three children, no charge for other children in a family.

"Unfortunately," says Wilkinson, "we can't sell this plan to individuals on a family basis. If this were possible, we would have 20,000 family subscribers within one week. We're forced to make this service available only to members of a group—which, basically, is reached through office or plant situations."

Members of P.S.I. either receive 30 days' continuous medication or

periodic reorders of drugs, whichever costs less. Experience has led to limiting the amount of a single prescription. The insurance now covers dosage quantities in amounts not exceeding the smallest package unit of that drug put out by the manufacturer.

"Public opinion has been very favorable," Wilkinson told *CW*. "General curiosity is still prevalent, though the diehards who claim that such a plan won't work are lessening. Our major problem this year will be to sell the service now that we've raised the price. The pilot year proved that the general public is receptive to such an idea, that it's possible to administer it from a business standpoint."

Outside Reaction: To obtain a more objective reaction to the plan, *CW* contacted both Canadian and U.S. pharmaceutical makers, members of pharmaceutical societies, wholesalers and retail druggist groups, and unions, got these reactions.

In Canada: John Turnbull, secretary-manager of the Canadian Pharmaceutical Assn. said that, in his opinion, most Canadian pharmacists seemed favorably inclined toward the plan and that they were watching it with close interest.

Contact with the sales managers of leading Canadian pharmaceutical

SPECIALTIES

makers revealed a much different attitude—largely synthetic, due mainly to lack of information. Several companies had not even heard of P.S.I., though they had a vague recollection that someone had tried to start up a prescription insurance plan. Two big Canadian-owned drug houses, Frosst and Horner, had virtually no opinion on the service, thought it unlikely that it would grow.

A minority opinion by a spokesman for a U.S.-owned company was that this plan was the thin edge of the socialistic wedge and they didn't like it because government might get interested and sponsor a similar plan on a broad scale.

Most Canadian companies queried said they thought general acceptance of such a plan would not increase prescription sales. These manufacturers maintain that fear that the doctor will prescribe expensive drugs doesn't keep people from going to doctors now. The fact that 17% of original prescriptions are never filled was attributed to "apathy and psychosomatic troubles."

One extensive comment on the Windsor plan came from the sales director of a U.S. drug company subsidiary who told *CW*: "We don't have an objection to drug insurance. I don't think the general public knows much about it at present—simply because it hasn't been in effect very long. I don't see why the idea couldn't work, providing there were enough participants in the program. I think it would improve business."

The U.S. View: In querying the top U.S. drugmakers, *CW* found officials of these companies woefully uninformed about the Canadian plan, slow to offer opinions about it.

One Midwest pharmaceutical house commented: "We have no reaction to the idea. . . . If such a service existed here we can't think of any objections to it, offhand. There's one possible danger—the extreme eagerness of any insurance group to receive discounts on drugs. This price-consciousness may cause trouble and might affect the price scales determined by a manufacturer."

Another drugmaker termed the whole thing "nebulous"; another, that it approved any kind of insurance that brings about improvement in medical care; and a third company, that the plan as practiced in Canada is no

detriment to the pharmaceutical industry because drugs under the plan are sold at normal retail levels.

The Pharmacists: *CW* talked to Robert Abrams, executive secretary of the American College of Apothecaries—a group made up mostly of owners of pharmacies dealing only in prescription items—and was told that there was no doubt of the interest in such plans in this country.

Abrams said that the real problem is whether the public will be willing to insure and pay the premiums for such a relatively small expenditure per capita. And he points out that the cost of administering such a plan could be forbidding because conceivably a company could spend \$1 handling a \$1.25 claim.

"We must say unquestionably," said Abrams, "that Blue Cross has increased the use of hospitals. I think with any type of insurance program, such as that in Canada, there would definitely be increased use of drugs."

A majority of Abrams' own group, the American College of Apothecaries at their May convention in New Orleans, indicated that they were favorably impressed by the Windsor plan.

Unions Like It: Major union groups are generally receptive to the idea of drug insurance. A spokesman for the UAW-CIO told *CW* "We are watching the Windsor operation very, very closely. In fact, their Canadian director has come to Detroit to report on progress made." He added that if such a plan were in operation in the U.S. the union would be interested in obtaining coverage benefits through management-labor negotiations at contract time.

The Public: An indication of how the general public feels about the idea of prescriptions being covered by insurance can be gauged by a national survey undertaken by the Health Insurance Institute. That survey showed that 38% of the 2,000 families (6,600 individuals) queried thought that health insurance should cover all drug expenditures, 12% thought they should cover 75%, 20% thought they should cover half of all drugs costs, the rest pegged estimates lower.

Part of a Trend: Whether the older Windsor plan or the newer group in California succeeds or not, pharmacists have clear signs that in the future they'll have to live—and it could be a prosperous life—with the idea of

more and more of their revenue coming from group insurance plans. The Windsor and California plans are just small tremors preceding the ground swell that's coming sooner and more extensively than most of them appear to realize. Other tremors:

- The Associated Hospital Service of New York (Blue Cross), after two unsuccessful tries, this April got an amendment added to the New York State Insurance Law which states that a hospital service corporation may provide reimbursement for expenses incurred outside of the hospital. Among the items covered by the amendment: drugs and medicines.

- Blue Cross of Northeastern Ohio will supply medication to patients for a two-week period after they leave a hospital and Blue Shield organizations in other areas will make an effort to broaden coverage to include the cost of drugs.

- The United Mine Workers in Kentucky, Pennsylvania and West Virginia already provided out-patient prescription service at below cost, and the United Steelworkers union is said to be considering an "all-inclusive" medical care program that would include drugs.

There are, of course, other, more general, considerations worth taking into account. One important factor—the growing percentage in the U.S. of people over 65. These people have above-average drug requirements—and as the group grows in number it will carry more weight—especially in election years—in agitating for extended coverage for drugs under state and federal benefits. Democratic groups in Congress have already drafted such bills.

Also an item to consider is the growing number of the "closed panel insurance plans" such as the Kaiser Foundation Health Plan on the West Coast and the Consolidated Edison Employees Mutual Aid Assn. Inc. of New York. These plans (which will grow now that the AMA has approved of doctors participation in them) will have to compete with other forms of health insurance and this will undoubtedly lead to more benefits—like drugs—being offered to prospective members. Blue Shield plans in Arkansas, North Carolina, Oklahoma, Nebraska, Delaware and the District of Columbia are already providing drugs as a prescriber benefit on ex-

tended or major-medical-type certificates.

There's this, too. The AMA, which used to frown on doctors owning their own pharmacies, is now giving this practice a less severe look. And with doctors sharing in the profits accruing from increased volumes of prescription trade, there's likely to be less physician opposition to any form of drug prepayment plans—privately or publicly sponsored.

Goodbye Margins? The pharmaceutical industry, now turning out the products for which the U.S. public is paying nearly \$2 billion each year, would have a legitimate complaint against these insurance plans if it meant increased volumes at the expense of reduced cost per prescription. But there's little to indicate that the price of prescription goes down as the number written goes up. It hasn't happened here under the largely private buying of drugs. And it hasn't happened in England. In fact, despite the mounting use of drugs by the British public (prescriptions written doubled from '50 to '58) there's been no reduction in average prescription cost—it's also doubled.

Crystal Ball: On the basis of its talks with representatives of the pharmaceutical industry and other interested parties, about the growth of prepayment prescription plans, *CW* sees these possibilities ahead:

- The volume of prescriptions should climb from 700,000/year to over 1 billion within the next few years—without a reduction in the average cost of prescription.
- There'll be more geriatric products put on the market to cash in on the greater ability of the aged to pay for these products.
- More doctors will not only prescribe the medicine—but also fill the order in their own pharmacies.
- Many prescription plans will be established and run by groups of pharmacists, but insurance companies will later take over.
- The public will worry about the high cost of premiums—but will pay them despite governmental findings of overprescribing and waste in these prepayment plans.

Blue Cross and Blue Shield have influenced the practice of medicine. Prepayment plans for drugs—in one form or another—will do the same to the marketing of prescription drugs.



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SALES AND DISTRIBUTION

Distributors Tell Their Top Marketing Problems

PRICE CUTTING

“There's no such thing as a firm price . . . certainly no such thing as a list price. You have to wheel and deal. If we sold at some of the prices around these days, we would be trading nickels (Chicago).”

SUPPLIER COMPETITION

“Competition with suppliers is our biggest problem. We feel it in cases where the manufacturer sells car and truckload quantities directly and in cases where he competes for less-than-carload lots (Seattle).”

'GYPSY' TRUCKING

“We are being hurt by 'gypsy' truckers. They haul agricultural produce north and bring alkalis south when they return. This makes it possible for compounders to buy caustics at less cost (Atlanta).”

IMPORTED MATERIAL

“Competition from imports is a big problem. It's especially bad on chlorinated solvents, urea and some inorganic items such as calcium and zinc chlorides, sodium bichromate, zinc chloride (Houston, Seattle).”

OVERCONCENTRATION

“Manufacturers have appointed too many distributors in many areas. When local business is split between many, they compete on price and offer nothing in the way of selling or service (New York).”

Price Competition Mars 'Best Year Yet'

Despite many recurrent marketing problems, chemical distributors are heading for a record-smashing sales year. Industrial chemical distributors this week are running 23% ahead of their '58 sales pace, with total (including explosives) '59 sales heading for \$1.5 billion. The increase promises to be the largest in seven years.

Drug wholesalers, however, are faring less well; their sales are about 9% over those of '58, with a total of \$2.94 billion indicated for '59. But paint and varnish jobbers are following the lead of industrial chemical wholesalers. After remaining on a

plateau of about \$312 million the past several years, their sales have forged 23% above the '58 level, may reach \$382 million for the year. The average increase for all drug, chemical and allied product merchants will likely be 14%, with a total volume of \$4.8 billion indicated.

The foregoing projections are based on the Dept. of Commerce's Monthly Wholesale Trade Reports. Sales of agents and brokers, not reported by MWTR, probably will add \$700 million more to the pot.

But if sales are increasing, so are the problems. Profits are not rising as

rapidly as sales, largely because of fierce price competition. Imports — particularly those of chlorinated solvents — are an important competitive factor. And this week, major producers of glycols, glycol ethers and ethanalamines trimmed jobber markups appreciably.

Margins on propylene glycol were slashed 17%; ethylene glycol, 26%; glycol ethers, 19%; triethanolamine 32%; and monoethanolamine, 40%. Though distributors fear other margin cuts, some welcome the 1/2¢/lb. boost in bulk-LCL differentials.

Big industrial markets — e.g., New

York and Chicago — are especially affected. Some jobbers in Chicago, for example, complain that it's almost impossible to sell perchlorethylene to dry-cleaners without offering free hangers. Another reports, "In certain cases, prices have dropped to the cost level."

Imports are especially troublesome in areas close to major ports. Chlorinated solvents often sell for 3-4¢/lb. less at port locations than do domestic materials. Imports of calcium chloride, sodium bichromate, sodium cyanide, zinc chloride and urea are also sighted as price-problem areas.

'Gypsy' Truckers: Contributing to the general price softness is the practice of "gypsy" trucking (*CW*, July 5, '58, p. 66). Producers offer a freight allowance discount to customers using their own trucks to pick up orders at plants or terminals. "Gypsy" resellers collect the freight allowance permitted under this practice, then resell small lots at cut-rate prices en route home.

This practice is an outgrowth of high truck freight rates, which have led many distributors to operate their own fleets — at costs below rates charged by common carriers.

Last year, many producers of chlorinated solvents eliminated freight allowances in an effort to curb abuses. But the situation is still plaguing jobbers of alkalis, solvents, formaldehyde, fatty acids and other chemicals. An Atlanta jobber, hard hit by truckers moving produce north and chemicals south, tells *CW* that "gypsies" sometimes offer savings to customers as high as 25¢/lb.

Other distributors object to several practices relating to bulk and semi-bulk distribution. Competitors, they assert, deliver by tank wagon to a customer's premises, fill drums on the spot, offer a tank-truck price. Others put in free storage tanks or charge customers the higher drum price until the cost of the tanks is paid for.

A big Chicago distributor claims that the tanks are often the cheapest available; fuel oil tanks are sometimes used for storing the much heavier chlorinated solvents. "We don't consider it our business to make or help make capital investments in a customer's operation. Besides the legal liability problems are serious." Some distributors, however, back the practice, consider it a logical and desirable form of customer service.

Supplier Competition: Apparently,

little progress has been made in recent years on the problem of supplier competition. Many jobbers still complain, *CW* finds, about "producers that create a distributorship, then go out and compete with the distributor's salesmen for the same LCL business."

The main problem concerns the LCL market: by and large, wholesalers concede the producers' right to bid for bulk sales. But on the West Coast, jobbers are running into more competition from suppliers for bulk business.

Until recently, many manufacturers relied on jobbers to handle sales in the West Coast's formerly less-significant chemical consuming markets. But the Western boom has led many suppliers to begin direct distribution. Result: locally established distributors are feeling the pinch.

Because they are distant from chemical producing centers, some Western jobbers are forced to carry inventories that are higher than those of jobbers close to manufacturing locations. A Northwest wholesaler, complaining of high inventory costs, says: "Producers don't realize what it costs to carry an inventory here."

Competition from suppliers on mixed carload and truckload shipments also remains a thorny problem. By ordering several items that together fill a freight car or truck, the customer gets a carload-quantity price rather than the higher LCL price. To beat this, some wholesalers are upping storage tank facilities, plan to get more into compartmentalized tank-wagon delivery.

Moreover, a major New York paint raw-materials wholesaler, whose opinion is shared by many, believes that the current pricing chaos has its roots in "too many appointments." A Western jobber puts it this way: "When one manufacturer gives his business to four or five distributors, they compete against each other, offer nothing in either selling or service, except price."

Producers, some say, should do a better job of selecting distributors. The small jobbers, they add, don't have enough operating capital, "sell at panic prices to pay bills . . . upset the market."

Part of the problem may lie in the lack of clearly written or oral understandings between middlemen and suppliers. A *CW* survey (*Aug. 23*,

'58, p. 76) indicated that the average distributor had clearly defined agreements with less than 35% of his suppliers regarding territory definition, responsibilities to suppliers, termination of business with suppliers, competition for the same customer's business, and inventory size.

Counter Attack: To meet the challenge posed by free-wheeling market conditions, there's evidence that distributors are trying to improve marketing. Some are planning more aggressive selling, more comprehensive sales training, more emphasis on the technical salesman. Others stress larger sales forces and customer services. Many expect to increase product lines, improve the product information they pass on to customers. A few plan to push "brandnames" to cash in on the suppliers' prestige and national advertising. Larger truck fleets and increased storage space are other considerations.

Because of the trend toward improved and larger facilities, it's likely that jobber inventories will rise. But they would probably be offset by increased sales and stock turnover. The Dept. of Commerce stock/sales ratio, which reflects business conditions, shows a downward trend in inventories since February. More significantly, since Nov. '58, monthly stock/sales ratio figure for industrial chemical distributors has been lower than in the previous year.

Jobbers, on the whole, report few serious sales problem areas, except where imports are concerned. They feel that boosts in sales volume this year will be across-the-board. Merchant chemical wholesalers will face continuing price competition and conventional marketing problems, but the emphasis in '59 will be in realizing the growing opportunities in the marketplace.

Potash Imports Shift

The potash import situation took a new turn this week as East Germany put the brakes on muriate sales to the U.S.

This move comes on the heels of widespread but unconfirmed reports of Russian potash shipments to the U.S. via the St. Lawrence Seaway (*CW*, June 6, p. 78; June 13, p. 77).

Fertilia Internationale Handelsstadt, the West German firm that han-

dles all sales of East German potash in the U.S. and Canada, will close its New York office this month. The closing results from the East German decision to discontinue potash exports to the U.S.

American potash producers foresee little direct effect on domestic markets — except for one possible benefit. French and West German firms that take up the slack along the Eastern seaboard may now show less interest in nibbling at domestic Midwestern markets. That's because France and West Germany will most likely regain the 40-60,000 tons of muriate business annually that Fertilta has been taking in recent years with slightly lower prices. Fertilta's '58 sales: 58,000 tons.

Fertilta, moreover, told *CW* it could have sold 80,000 tons of potash in the U.S. in '59, some 20,000 tons more in Canada. Most recent shipment to arrive was unloaded in Southeastern ports in early Feb. '59.

Besides closing its New York office, Fertilta may liquidate its organization in Bremen because of acute labor turmoil, a dearth of skilled workers and a critical shortage of modern, efficient equipment at the East German mines. Extensive East German deposits are considered sufficient for a century at present consumption levels, and world markets are available for the potash. But operating troubles have forced curtailment of production, and the dwindling output is spread thin because of the Communist bloc's huge home consumption and its vast commitments through barter agreements with many underdeveloped countries.

In typical barter deals, Iron Curtain potash is traded in the Near East, presumably for crude oil, is exchanged in South America for Brazilian coffee or Colombian raw materials. Now trade sources tell *CW* that Canada is seriously considering bartering part of its large meat surplus for East German potash.

With the clouds of labor unrest and economic stagnation hanging heavy, it's doubtful that much East German potash will be sold in the U.S. Potash marketers believe there is little chance that East Germany will re-enter the market unless its current political and economic troubles clear up. And the way things are going, that may be a long time.

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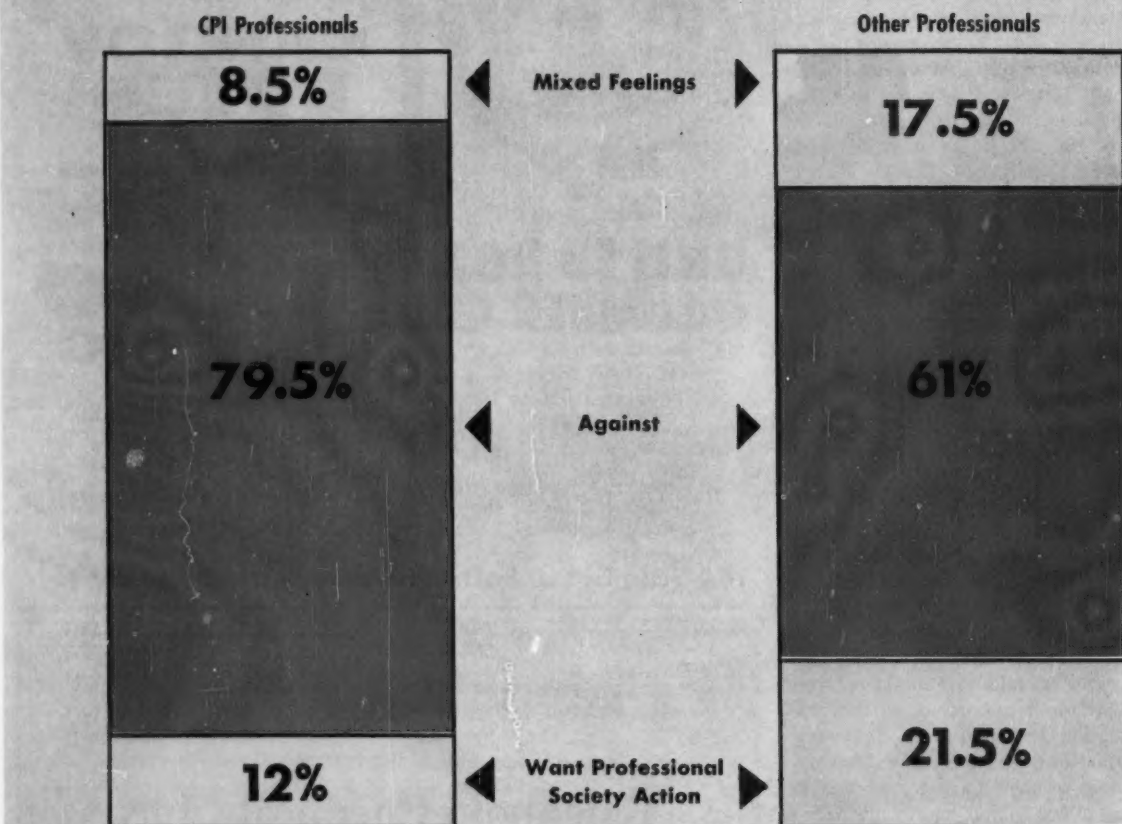
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June 17, 1959.

ADMINISTRATION

How scientists and engineers feel about collective bargaining



Source: Bureau of Industrial Relations, University of Michigan, Ann Arbor.

CPI Scientists Sound Off About Unions

Scientists and engineers in companies related to the chemical process industries show a greater distaste for collective bargaining than do their counterparts in other fields. This is indicated by analysis of a recently published study by the University of Michigan's Bureau of Industrial Relations.

The study, called "Collective Bargaining as Viewed by Unorganized Engineers and Scientists," involved 264 professionals at 10 companies, six of which utilize some form of chemical processing in their operations. Comparison of these six companies with the other four shows that 79.5% of 166 scientists and engineers with chemical affiliations were strongly or

mildly against collective bargaining, while 8.5% have mixed feelings or are neutral to the prospect and 12% would like to see some form of professional society action. These figures are compared with the response by 98 interviewees in nonchemical process industries — 61% against, 17.5% with mixed feelings and 21.5% in favor of society action.

John Riegel, professor of industrial relations at the university and author of the study, found, among other things, that there was a direct relationship between how an individual feels about his salary and how he views collective bargaining. The industry comparisons would seem to indicate that those in chemically re-

lated industries are more satisfied with their salaries than those in the other group.

Significantly, Riegel finds that in 35 of the 90 smaller work groups examined, there was some sentiment in favor of collective bargaining, even though majority opinion was opposed.

The findings of the study were published just at the time one major union of the chemical process industries, International Chemical Workers Union, through its affiliation with AFL-CIO's Industrial Union Dept., is mounting its first campaign to implement white-collar organizing. IUD held its meeting a fortnight ago in Washington, D.C. The 10 member unions participating agreed to start

a training school to teach organizers special techniques of enrolling professional or technical employees.

Both ICWU and the Oil, Chemical & Atomic Workers Union, faced with static or dwindling membership rolls as a result of automation, are turning their attention with greater enthusiasm to the white-collar man. ICWU, however, points out that preparation for such activity takes some time and that such organizing is still in the planning-board stage. The union implies that it has fairly specific ideas where it might make an "appropriate entry in the field." This would probably be in companies where "blue collars and white tend to blend into gray."

Hard Road: The unions have a hard road ahead of them. Some idea of the extent of their white-collar organizing task may be taken from a report of the National Office Management Assn. on its annual clerical salary survey, released last week. It shows a slight decrease in the unionization of office employees from '58. Some 92% of those surveyed indicated that there was no unionization of their office forces; 7.8% reported that all or part was unionized.

White-Collar Pressure: The unions feel that white-collar unionization may be their big chance for growth.

But the customary unions, including those in the chemical fields, may have more than numbers to contend with.

Professor Riegel points out in his survey that professional people are interested in intangible, as well as monetary, rewards — items that few unions can provide. One comment typifies this feeling: "I do not favor collective bargaining. The professional is not a part of the labor force. He should be considered a part of management." Some professionals even feel that collective bargaining implies standardization of their talents, would reflect on their individuality.

Upshot: The report seems to bear out what industrial men have said before: unionization of white-collar workers is a long way off, may be accomplished only by a new set of unions unidentified with standardized rewards, putting equal emphasis not only on tangible but also on intangible rewards. Right now, though, CPI scientists are giving no encouragement to the organizers.

Defining Pollution Problems

Close to 650 air-pollution experts last week gathered at Los Angeles for a key air-pollution-control conference. They quickly became embroiled in discussions as dense and confusing as the heavy Los Angeles smog that greeted them. Under discussion: federal vs. local control of air pollution, olefin content of automobile exhausts and sulfur content of fuels—perplexing problems that plague chemical process industries management across the country.

The experts — engineers, scientists and government officials from the U.S., Canada and Mexico — were delegates to the week-long 52nd annual meeting of the Air Pollution Control Assn.

Controversial Views: A controversial note was struck by keynote speakers Ernest Hart, Food Machinery and Chemical Corp. president, and California State Senator Richeard Richards.

Hart, speaking on behalf of the Manufacturing Chemists' Assn., urged that air-pollution problems be handled on a local level, that the federal government not interfere in air-pollution activities. Said Hart, "We (MCA) believe that local control is and can be the most effective way to take care of this complex problem."

Senator Richards told the delegates that industry has nothing to fear from governmental regulations concerning air-pollution control. "Air pollution is no respecter of county, state or federal boundaries," he said. "We need work on air pollution from every agency and individual."

Blasts Auto Industry: Richards criticized the automobile industry's "unworthy attempts" to do something about air pollution. "Only pressure from our air-pollution agencies made them come around to a point of view that reflects more positive thinking on the subject."

Another approach of broad significance to the CPI and industrial communities alike was the alternate program for exhaust-pollution control supported by the Los Angeles Air Pollution Control District. The approach calls for controlling the olefin content of gasoline in the belief that, thereby, olefin content of exhaust

will be reduced. APCD's Rule 63 provides that the olefin content of gasoline mixed in the Los Angeles basin after June 30, '60 must not exceed a level of 30 in the standard bromine-number olefin measure. After Dec. 31, '61, the bromine number must be less than 20.

Many CPI spokesmen and local government pollution experts agree that controlling nonindustrial pollution causes—e.g., auto-exhaust gases, will result in removal of much of the blame for pollution now being heaped on industry. Important bystander in the battle of the exhausts is the Western oil industry — on record as being neither for nor against Rule 63.

Sulfur Fuels Hit: For some time, the question of the relation of sulfur content of fuels to air pollution has been foremost in control experts' minds. Heated discussions by conferees stemmed from recent comments of General Petroleum Corp. President R. L. Minckler. He proposed strengthening of the rules affecting the burning of fuel oil in the Los Angeles basin. "We feel that sulfur dioxide is not now a hazard to the health of the community. However, we should guard against buildups in sulfur dioxide concentration by prohibiting the burning of high-sulfur fuels at any time, and by prohibiting burning of fuels with more than one-half percent sulfur when sulfur-dioxide levels reach 1 ppm."

Costs Go Up: Disheartening to delegates was a warning by Warren Dorn, Los Angeles County supervisor and chairman of the board of supervisors' air-pollution committee. He said Los Angeles County experiences had shown that the more pollution that is removed from the atmosphere, the more expensive it becomes to control and eliminate additional sources. He also predicted that costs of eliminating smog from the Los Angeles basin would continue to rise for industry as well as for the taxpayers—a fact that industry and municipal pollution-control experts throughout the country have come to apply to their own pollution problems in the search for better control.

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| New York 36 | Knox Armstrong, B. A. Johnson, P. E. McPherson, Charles F. Onasch, L. Charles Todaro, 500 5th Ave., OXford 5-5959 |
| Philadelphia 3 | William B. Hannum, Jr., 6 Penn Center Plaza, LOcust 8-4330 |
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| San Francisco 4 | William C. Woolston, 68 Post St., DOuglas 2-4600 |
| St. Louis 8 | R. J. Clausen, 3615 Olive St., Continental Bldg., JEfferson 5-4867 |

ADMINISTRATION

LEGAL

Metal-Protection Suit: Another trade-secrets suit has been settled, this time in the metal-protection field. Corrosion Rectifying Co. has been cleared of charges of using trade secrets belonging to Cathodic Protection Service, Inc., and of enticing Cathodic employees to join Corrosion. Both firms are located in Houston, Tex.

In a civil trial, Civil District Judge Wilmer Hunt (Houston), after hearing five days of testimony, instructed the jury to return a verdict in favor of Corrosion. Cathodic brought the suit two years ago (*CW*, Sept. 7, '57, p. 57), asked \$500,000 in damages for secrets allegedly stolen, and an injunction against alleged bribery attempts by Corrosion.

Food Additives Petitions: Food chemical makers lost little time before flooding the Food & Drug Administration with applications to have food chemicals accepted under the new food additives law that became effective March 5. According to FDA, 23 petitions have been received.

FDA reports that it has officially filed five of the 23 petitions, received and allowed two proposals to go into effect covering the use of an anti-oxidant in animal and poultry feeds.

FDA said it has been requested to set tolerances for a number of chemicals that come in contact with food. But, so far, the only tolerances established under the new law are those for a preservative to be added to forage crops and poultry feeds to prevent loss of vitamin content.

LABOR

Milling Workers: Preparations for a broad strike of workers in the wet-milling industry were made by the Oil, Chemical & Atomic Workers Union when it ordered a strike vote of 6,000 employees covered by OCAW contracts. Vote was ordered after OCAW said no progress had been made in negotiating sessions with companies at Chicago and Kansas City during May. Participating in the voting last week were employees of National Starch Co. (Indianapolis), Union Starch Co. (Granite City, Ill.), American Maize, Inc. (Hammond, Ind.) and four plants of Corn Products Co. (Corpus Christi,

Tex., Kansas City, Mo., Pekin, Ill., Argo, Ill.). OCAW claims that wages is the principal issue in current bargaining.

Westvaco Strike: Food Machinery and Chemical employees in the Westvaco Division at South Charleston, W.Va., have gone out on strike after expiration of a two-year contract with Local 16265, District 50, United Mine Workers. Membership voted down a proposed contract that offered a 13¢/hour increase now and 9¢ next year, with improved pension, vacation and holiday benefits. The union asserts that there are still outstanding grievance matters to be settled, and that wages is not the prime issue.

Chlorine Strike: At International Minerals & Chemical Corp.'s Niagara Falls, N.Y., plant employees have followed up their strike vote of three weeks ago, walked out of chlorine-caustic production and maintenance jobs. Dispute is over wages and fringe benefits offered by IMC to OCAW Local 15-12373. No new talks have been scheduled.

KEY CHANGES

James L. Martine to executive vice-president, **Henry A. Kennington** to vice-president and director of sales, Vestal Inc. (St. Louis, Mo.).

Alfred W. Knight to president, Western Precipitation Corp. (Los Angeles).

William F. Drees to vice-president, Formica Corp. (Cincinnati), subsidiary of American Cyanamid Co. (New York).

Frederick G. Law to vice-president, Columbian Carbon Co. (New York).

Kerby H. Fisk to board chairman, and chief executive officer, **Harry S. Ferguson** to chairman of the executive committee and chief administrative officer, **Chester M. Brown** to president and chief operating officer, Allied Chemical Corp. All effective upon retirement in September of **Glen B. Miller**, president.

Hans Stauffer to director, American Smelting and Refining Co. (New York).

Tracers

TO THE
CHEMICAL
PROCESS
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POSITIONS VACANT

Chief Chemist—Rapidly growing heavy chemical manufacturer in North Jersey has an opening for a Chief Chemist preferably with sulfuric acid experience. Advancement opportunities available. All replies confidential. P-1896, Chemical Week.

Technical Service—An excellent opportunity for young man to join the Technical Department of the expanding Plastics Division of Spencer Chemical Company. This man should have a strong background in chemical engineering or chemistry, with a minimum of three years experience in the field of polyolefins. He will conduct studies on extrusion and molding of polyolefins and nylon, and have intimate contact with field technical service work. In reply, please send detailed resume of experience, education and salary requirements to: Personnel Manager, Spencer Chemical Company, 610 Dwight Building, Kansas City 5, Missouri.

Chief Chemist—Rapidly growing heavy chemical manufacturer in North Jersey has an opening for a Chief Chemist preferably with sulfuric acid experience. Advancement opportunities available. All replies confidential. P-1924, Chemical Week.

Salesmen: The two-fold expansion of our manu-facturing facilities provides a challenge for our expanding sales force. This offers an unusual opportunity for the exceptional man to develop to the maximum of his potential. Chemical sales experience preferred, with a degree in chemistry or chemical engineering. Send resume in confidence to: Personnel Manager, Jefferson Chemical Company, Inc., P.O. Box 303, Houston 1, Texas.

SELLING OPPORTUNITIES OFFERED

Resin Salesman Wanted—New York Area. Great opportunity for aggressive individual to associate with rapidly expanding national company. Will handle full line of synthetic resins. Must have knowledge of paint formulation. Excellent job for the right man. Submit complete resume. SW-1940, Chemical Week.

Chemical Salesman: Locate in Cleveland area for large Eastern manufacturer of surface active agents on a national basis to other chemical manufacturers. Good position in paying territory for man with strong sales background in chemical industry. Salary, commission, expenses and car allowance. Forward resume to SW-2017, Chemical Week.

SELLING OPPORTUNITIES

If you are a manufacturer seeking new or added sales outlets—or if you are a manufacturer's agent or chemicals distributor with the capacity, time and energy to take on additional lines—make your interests known in this column of Chemical Week. The right agent or jobber teamed up with the saleswise manufacturer makes the right combination for the hard selling days ahead. There's profit for both, which can be initiated through low-cost classified advertising. Write Employment Opportunities, Chemical Week, P.O. Box 12, New York 36, N.Y.

POSITIONS WANTED

Salesman 30, Aggressive, Mature, Adaptable, B.S., M.B.A. 60 Non-Technical. Experienced Industrial, Automotive Chemical Markets seeks opportunity with Producer. PW-2020, Chemical Week.

Chemical Engineer, B.S. degrees in Ch.E. & Bus. Admin. Veteran, seeks position with future in market Research or Dev. PW-2026, Chemical Week.

MANAGEMENT SERVICES

Clark Microanalytical Laboratory—CH. N. S. Halogen, Fluorine, Oxygen, Alkoxyl, Alkyl, Acetyl, Terminal Methyl, etc. by specialist in organic microchemical analysis. P.O. Box 17, Urbana, Ill., Empire 7-8406.

CHEMICALS WANTED

Acids Surplus Wanted—Chemicals, Pharmaceu-ticals, Oils, Plasticizers, Resins, Dyes, Solvents, Pigments, Etc. Chemical Service Corporation, 96-02 Beaver Street, New York 3, N. Y. HANOVER 2-6970.

BUSINESS OPPORTUNITY

Is your co. for sale? Do you wish to Merge? We are management brokers exclusive to the Drug & Chemical industries. No matter what your size, if you wish to buy or sell we can help you. All information kept confidential. BO-1989, Chemical Week.

FOR SALE

\$3,000,000 Liquidation—Chemical Plant at Orange, Texas. Type 316 Stainless Steel Tanks, Kettles, Heat Exchangers, Columns, Stills, Crystallizers, Centrifugals, Pumps, Valves, etc. Wonderful Values. Send for list. Perry Equipment Corp., 1415 N. 6th St., Philadelphia 22, Pa.

For Sale—Goebel Brewery, Muskegon, Michigan, complete plant; Goebel has concentrated all production in Detroit, Michigan, and we are liquidating this equipment, including bucket elevators; phenolic-lined 6000-gal. hot water tanks; 2—1650 bu. cap. ca. bins; 6000-gal. copper steam-jacketed cooker; "American" Model HS 15 x 9 hop pulverizer with G.E. 15 HP, 60/220/440/3-phase AC motor, practically new; 100' x 10" screw conveyor, Westinghouse 5 HP, 440 volt; 18—3500-gal. ea. phenolic-lined one-piece tanks, 9 dia. x 12'6" long; 4—11,000-gal. ea. same as above; 6—12,000-gal.; 3—1800-gal.; oak, cypress, etc. wood tanks ranging 4500-7500 gal. cap. ea.; Worthington 1½" Monobloc centrifugal pump, stainless tanks; Economy baler Style 72F3; 65' Alvey Figure 400 chain conveyor for cases, boxes, etc.; AC motors; 3 x 2 caustic pump, 7½ HP; 2—15,000-gal. oil tanks, insulated, 10' dia. x 24'; Pomona deep well pump, cap. 90 gpm against 75' head, completely overhauled 1955; Nash "Hytor" air compressors, 50 HP, 25 HP, 10 HP; 3 York ammonia compressors, 7½ x 7½, 8 x 8, 9 x 9, completely overhauled 1956; shell and tube condensers, ammonia receiver, etc.; "Superior" 150 HP package steam generator, new 1947, complete installation, 500 sq. ft. heating surface, with fully-automatic oil burner; "Kirk" Muskegon HRT boiler, new 1935, 150 p.s.i., oil-fired; misc. boiler feed water pumps; complete Permutit water treating system; 10 air receivers, 30" dia. x 10'6" high overall, ASME code stamped; 15 centrifugal and portable pumps, some with explosion-proof motor, all AC; "Niagara" Model 275 stainless diatomaceous earth filter, 17 Niagara stainless riveted leaves in 42" tank; separate Niagara enclosed stainless slurry feeder, size 2; Klein #3 vertical filters, \$250 ea.; several air conditioning units and individual room coolers and diffusers; motors, conveyors, pipe, I-beams, tubing, etc. Write for free inventory, photos and listing to: Maurice Osterman Vice President, c/o Charles S. Jacobowitz Corp., 3082 Main St., Buffalo 14, N.Y. Phone AMherst 2100.

For Sale—Two Alvey pallet loading machines, installed new 1954, in daily operation, available August, buy one or both; Standard Knapp Model 830 duplex bottle packer, also new 1954. Write for details, Charles S. Jacobowitz Corp., 3082 Main St., Buffalo 14, N.Y.

Tank Trailers for Chemicals Stainless Steel—new and used, Hackett Trade Co., Inc. P. O. Box 803, Packers Sta., Kansas City, Kas. MA 1-2363.

Mixer, Vertical 100 gallon capacity, jacketed for water or steam, double mixing paddles with planetary drive 5 HP motor, excellent condition, reasonable price. FS-2008, Chemical Week.

Bakelite BR-9432 Resin (Phenol-Formaldehyde) \$33/lb. (Orig. Bbls.). Carbon Tetrachloride—Redist. & Restabilized \$.075/lb. (Bulk). TCP—off color 5 drums \$.26/lb. DOA, Virgin, Off Color 10 drums \$.35/lb. Barium Hydrox. N.F., (J. T. Baker Orig.) 15 Leverpaks \$.06/lb. DBM, Virgin, Off Color 30 drums \$.15/lb. Wash Acetone, 100% Ketone w/w and dry \$.07/lb. (Bulk). Lacquer Thinner, Off Color \$.25/gal. (Bulk). FS-1898, Chemical Week.

WANTED/FOR SALE

This Tracer Section can be used whenever you are looking for or offering Equipment, Plants Supplies, Chemicals, Opportunities, Special Services. The rates are low—just call or write Classified Advertising Division, Chemical Week. P.O. Box 12, N. Y. 36, N. Y. LONgacre 4-3000.

BUSINESS BENCHMARKS

Week

54 OUTPUT INDEX

1958

210

200

190

180

170

160

55 PRICE INDEX

1958

120

115

110

105

100

J F M A M J J A S O N D

JULY 4, 1959

WEEKLY BUSINESS INDICATORS

| | LATEST WEEK | PRECEDING WEEK | YEAR AGO |
|--|----------------|-------------------|-------------|
| Chemical Week output index (1947-1949=100) | 204.0 | 202.5 | 172.0 |
| Chemical Week wholesale price index (1947=100) | 112.1 | 112.1 | 110.6 |
| Stock price index (11 firms, Standard & Poor's) | 57.83 | 56.67 | 39.93 |
| Steel ingot output (thousand tons) | 2,627 | 2,620 | 1,666 |
| Electric power (million kilowatt-hours) | 13,331 | 13,503 | 11,941 |
| Crude oil and condensate (daily av., thousand bbls.) | 7,016 | 7,009 | 6,345 |

MONTHLY INDICATORS

(million dollars)

| | LATEST MONTH | PRECEDING MONTH | YEAR AGO |
|-------------------------------|-----------------|--------------------|-------------|
| All manufacturing | \$30,232 | \$29,106 | \$24,945 |
| Chemicals and allied products | 2,088 | 1,979 | 1,832 |
| Petroleum and coal products | 3,059 | 3,046 | 2,594 |
| Paper and allied products | 1,036 | 988 | 874 |
| Textile products | 1,241 | 1,200 | 1,016 |

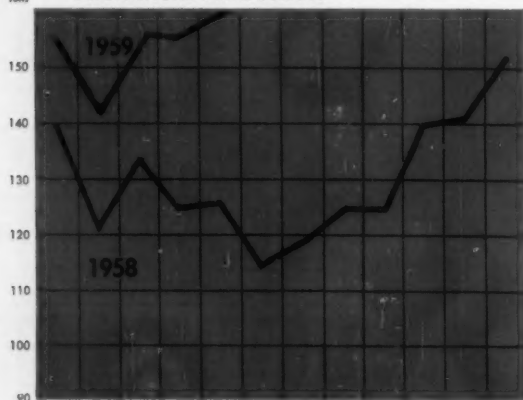
Manufacturers' Sales

Manufacturers' Inventories

PROCESS INDUSTRIES CLOSE-UP

Thousand
tons

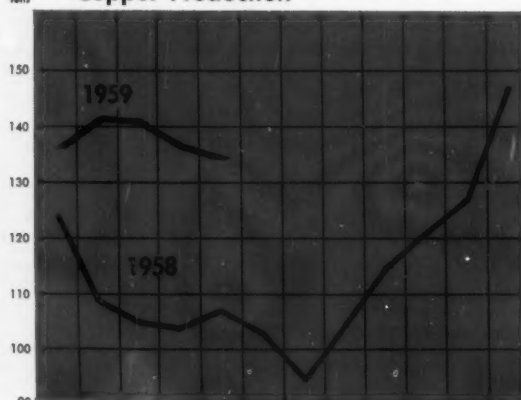
Aluminum Production



JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

Thousand
tons

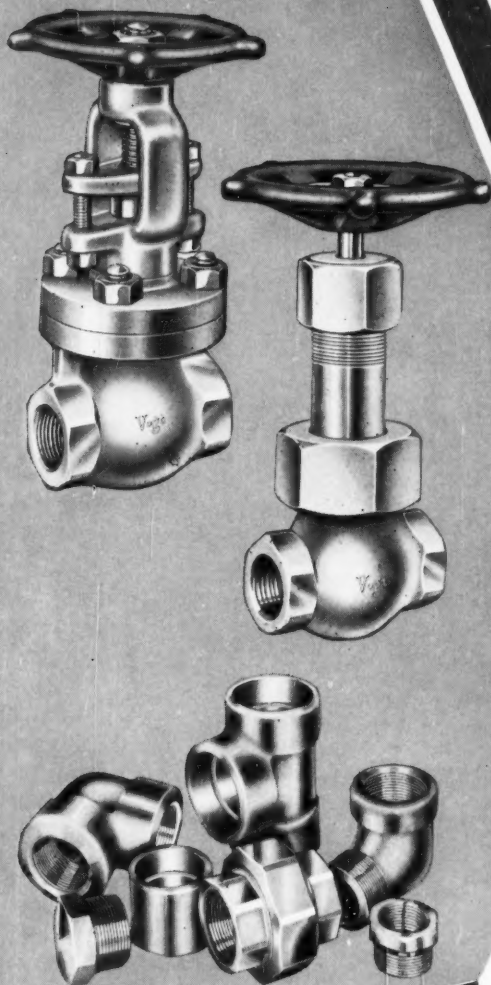
Copper Production



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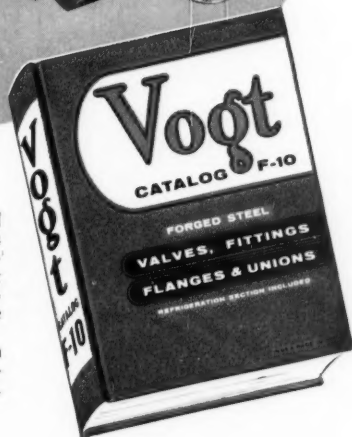
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